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Fully accredited by the Southern Association of Colleges and Schools since 1922.

(A new administrative organization for the University was approved by the Board of Trustees on March 6, 1985. Implementation will proceed over the next several months, and will be reflected in the next catalog issue, 1986-87.)

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A Land-Grant University
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CATALOG NUMBER 1985-86

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Board of Trustees

UNDER THE ORGANIC and statutory laws of Alabama, Auburn University is governed by a Board of Trustees consisting of one member from each congressional district, as these districts were constituted on January 1, 1961, an extra member from the congressional district in which the institution is located, and the Governor and State Superintendent of Education, who are members *ex officio*. The Governor is President. Members of the Board of Trustees are appointed by the Governor by and with the advice and consent of the State Senate and hold office for terms of twelve years. Members of the board receive no compensation. Trustees serve until reappointed or their successors are named. By executive order of the Governor in 1971, a non-voting student representative, selected by the Student Senate, serves as a member *ex officio*.

The Board of Trustees places administrative authority and responsibility in the hands of an administrative officer at Auburn University. The institution is grouped for administrative purposes into divisions, schools, and departments.

MEMBERS EX OFFICIO

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Student Body Representative, non-voting Auburn University at Montgomery	

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School of Arts and Sciences

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School of Business

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Dean of Students

DR. WILLIAM C. HIGHFILL
University Librarian

DR. IAN R. HARDIN
Chairman, General Faculty

1985

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UNIVERSITY CALENDAR 1985-86

1985 Summer Quarter (47 class days)

Eight-Week Term (36 class days)

- June 1, *Sat.* Last day for completing applications for admission
- June 13, *Thurs.* Orientation for new students
- June 14, *Fri.* Final Registration and Schedule Adjustment
- June 17, *Mon.* Classes begin
- July 4 & 5, *Thurs. & Fri.* Independence Day Holidays
- July 15-19, *Mon.-Fri.* *Registration for Fall Quarter

- July 23, *Tues.* Mid-Quarter
- Aug. 7, *Wed.* Classes end for Term
- Aug. 8 & 9, *Thurs. & Fri.* Final Examinations for Term
- Aug. 22, *Thurs.* Classes end for Quarter
- Aug. 23, *Fri.* Dead Day
- Aug. 24, 26, 27, 28, *Sat., Mon., Tues., Wed.* Final Examinations
- Aug. 29, *Thurs.* Graduation

1985 Fall Quarter (48½ class days)

- Sept. 1, *Sun.* Last day for completing applications for admission
- Sept. 23, *Mon.* Orientation for new students
- Sept. 24 & 25, *Tues. & Wed.* Final Registration and Schedule Adjustment
- Sept. 26, *Thurs.* Classes begin
- Oct. 15, *Tues.* General Faculty Meeting
- Oct. 23-Nov. 4, *Wed.-Mon.* *Registration for Winter Quarter

- Oct. 30, *Wed.* Mid-Quarter
- Nov. 27-Dec. 1, *Wed. Noon-Sun.* Thanksgiving Holidays
- Dec. 2-6, *Mon.-Fri.* Schedule Distribution and Fee Payment for Winter Quarter
- Dec. 5, *Thurs.* Classes end
- Dec. 6, *Fri.* Dead Day
- Dec. 7, 9, 10, 11, *Sat., Mon., Tues., Wed.* Final Examinations
- Dec. 12, *Thurs.* Graduation

1986 Winter Quarter (47 class days)

- Dec. 10, *Tues.* Last day for completing applications for admission
- Jan. 2 & 3, *Thurs. & Fri.* Final Registration and Schedule Adjustment
- Jan. 6, *Mon.* Classes begin
- Jan. 28-Feb. 7, *Tues.-Fri.* *Registration for Spring Quarter
- Feb. 7, *Fri.* Mid-Quarter

Mar. 4-7, *Tues.-Fri.* Schedule Distribution
and Fee Payment for Spring Quarter

Mar. 11, *Tues.* Classes end

Mar. 12, *Wed.* Dead Day

Mar. 13, 14, 15, 17, *Thurs., Fri., Sat., Mon.*
Final Exams

Mar. 18, *Tues.* Graduation

1986 Spring Quarter (46 class days)

Mar. 1, *Sat.* Last day for completing
applications for admission

Mar. 25 & 26, *Tues. & Wed.* Final Registration
and Schedule Adjustment

Mar. 27, *Thurs.* Classes begin

Apr. 22, *Tues.* General Faculty Meeting

Apr. 23-May 5, *Wed.-Mon.* *Registration for
Summer or Fall Quarter

Apr. 30, *Wed.* Mid-Quarter

May 27-29, *Tues.-Thurs.* Schedule Distribution
and Fee Payment for Summer Quarter

May 29, *Thurs.* Classes end

May 30, *Fri.* Dead Day

May 31-June 2-4, *Sat., Mon., Tues., Wed.*
Final Examination

June 6, *Fri.* Graduation

**1986 Summer Quarter (47 class days)

Eight-Week Term (37 class days)

June 1, *Sun.* Last day for completing
applications for admission

June 12, *Thurs.* Orientation for new students

June 13, *Fri.* Final Registration and
Schedule Adjustment

June 16, *Mon.* Classes begin

July 4, *Fri.* Independence Day Holiday

July 14-18, *Mon.-Fri.* *Registration for
Fall Quarter

July 21, *Mon.* Mid-Quarter

Aug. 6, *Wed.* Classes end for Term

Aug. 7 & 8, *Thurs. & Fri.* Final Examinations
for Term

Aug. 20, *Wed.* Classes end for Quarter

Aug. 21, *Thurs.* Dead Day

Aug. 22, 23, 25, 26, *Fri., Sat., Mon., Tues.*
Final Examinations

Aug. 27, *Wed.* Graduation

NOTE: Schedule distribution and fee payment for Fall Quarter will
be accomplished by mail prior to the opening of the Quarter.

*The individual schools will publish the days of registration that will
be utilized during the nine-day University registration period.

**All dates in the Summer Quarter are tentative and are subject to
final approval prior to 1986-87 catalog printing.

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(A new administrative organization for the University was approved by the Board of Trustees on March 6, 1985. Implementation will proceed over the next several months, and will be reflected in the next catalog issue, 1986-87.)

The University

AUBURN UNIVERSITY, chartered in 1856, is located in Auburn, Alabama, on Interstate 85 in the eastern section of the state. Surrounded by farms and woodlands, the University enjoys the advantages of the security, seclusion, and clear air afforded by a small residential city. The 1,871-acre campus, with 73 major buildings, uncrowded and uncluttered, is distinguished by its buildings, lawns and flowers, trees and playing fields. Ten Undergraduate Schools and a Graduate School have emerged to define and carry out the purposes of the institution. The academic program is fully accredited by the Southern Association of Colleges and Schools.

As a land-grant university, Auburn is dedicated to service to Alabama and the nation through its three divisions of instruction, research, and extension. Instruction is the academic process on campus between professors and students. Research is carried on continually to increase knowledge. Extension programs provide educational services and special assistance throughout the state.

Auburn is proud of its graduates, many of whom have distinguished themselves in the professions, business and industry, government and military service, politics, and athletics. Some 118,000 persons have earned Auburn degrees.

The University traces its beginning to the East Alabama Male College, a private liberal arts institution whose doors opened in 1859. From 1861 to 1866 the college was closed because of the Civil War. The college had begun an affiliation with the Methodist Church before the war. Due to financial straits, the church transferred legal control of the institution to the state in 1872, making it the first land-grant college in the South to be established separate from the state university. It thus became the Agricultural and Mechanical College of Alabama.

Women were admitted in 1892, and in 1899 the name again was changed, to the Alabama Polytechnic Institute. In 1960, the school acquired a more appropriate name, Auburn University, a title more in keeping with its location, size, and complexity. The institution has experienced its greatest growth since World War II, and today enrolls 18,888 students, the largest on-campus enrollment in the state. The majority are Alabama residents.

Auburn University at Montgomery was established as a branch campus in 1967. The institution has developed rapidly, especially since moving to a new 500-acre campus just east of Montgomery in 1971. The AUM enrollment now stands at 5,200.

Purpose of the University

Auburn University is a comprehensive land-grant university, with campuses at Auburn and Montgomery, serving Alabama and the nation. The University is especially charged with the responsibility of enhancing the economic, social, and cultural development of the state through its instruction, research, and extension programs. In all of these programs the University is committed to the pursuit of excellence.

The University has an obligation to provide an environment of learning in which the individual and society are enriched by the discovery, preservation, transmission, and application of knowledge; in which students grow intellectually as they study and do research under the guidance of a competent faculty; and in which faculty develop professionally and contribute fully to the intellectual life of the institution. This obligation unites Auburn University's continuing commitment to its land-grant traditions and the institution's role as a dynamic and complex comprehensive university.

Auburn University is dedicated to these purposes:

Providing for its students, a broad general education, enhancement of personal and intellectual development, and specialized education through the University's undergraduate, professional, and graduate programs;

Preparing graduates whose knowledge, intellectual discipline, and experience in the multiple aspects of our culture will be manifest in service to the people in this state, the nation, and the world;

Conducting a broad program of research, both basic and applied, to stimulate the faculty and students in the quest for knowledge, to promote their intellectual growth and development, to broaden the foundations of knowledge, to increase understanding of our world, and to aid society in resolving its scientific, technological, economic, and social problems;

Creating and implementing effective programs of education and service that will provide special assistance throughout the state and the nation through the extension of the scientific, professional, and cultural resources of the University to individuals, communities, institutions, and industries, thereby contributing to an improved technology, better environmental and health conditions, enhancement of the general quality of life, and the development of a more responsible citizenry;

Fulfilling the University's responsibilities for instruction, research, and service in science and technology, including agriculture and engineering and programs in biological sciences, mathematics, physical sciences, social sciences, and statutory mandate for the Alabama Agricultural Experiment Station and the Alabama Cooperative Extension Service;

Encouraging scholarly and creative efforts in the arts and humanities so that the University may serve its students and the larger community as a vital source of general education and cultural enlightenment and as a stimulus toward participation of an educated citizenry in all avenues of life;

Fostering programs of education and research in those professional curricula uniquely or traditionally associated with Auburn University.

Auburn University is committed to reassessing its objectives and programs continually in order to assure their consistency with new knowledge and changing economic and social conditions and to seek more efficient and imaginative means of fulfilling the University's purposes.

Research

Auburn University's commitment to the creation and application of knowledge is reflected in the broad programs of research that have developed within the University. The contributions made by the University's faculty and students through basic and applied research have a significant impact on the economic, social, and intellectual well-being of the citizens of the State. These research activities are also essential to the quality of the University's graduate programs.

The organized research programs at the University include the Agricultural Experiment Station established in 1883 and the Engineering Experiment Station established in 1929. Beyond the contributions of these experiment stations, extensive research and other creative activities are performed by faculty in the sciences, humanities, and the arts. Much of this work is supported through contracts and grants awarded by federal and state agencies as well as private businesses and industries.

Extension

Extension, another of Auburn's principal responsibilities, involves developing and carrying educational services to the farms, homes, industries, communities, and municipalities of the state. The Alabama Cooperative Extension Service of Auburn University has provided such services to Alabama's 67 counties since 1914. Included are programs for agriculture and natural resources, home economics, community resource development, and 4-H youth activities.

Extension and continuing education programs are available through the Engineering Extension Service, the Schools of Architecture and Fine Arts, Arts and Sciences, Business, Education, Pharmacy and Veterinary Medicine. In addition, the Office of Continuing Education conducts a large number of noncredit, community-oriented short courses to provide background for further study, cultural development, and renewal of professional skills.

Also, Educational Television presents public service programs, and the University library cooperates with public libraries to make materials available throughout the State. Several specialized extension programs such as the Office of Public Service and Research, the Continuous Professional Development Program, the Energy Extension Service and the Auburn Technical Assistance Center provide additional dimensions of service to the people of Alabama.

Instruction

Instruction of students is the primary mission of the University. In the classroom, the laboratory, the library, Auburn University's goals are to quicken the students to reach their full potential, instilling respect for intellectual inquiry and understanding of cultural tradition; and to equip them with the knowledge and skills which they will need in a demanding and increasingly complex society.

The University faculty offers specialized instruction leading to the bachelor's degree in 138 fields in 58 departments, the master's degree in 52 fields, and the doctorate in 31 areas. The faculty and curricula are organized into 11 undergraduate schools: the School of Agriculture and Biological Sciences; the School of Architecture and Fine Arts, the School of Arts and Sciences, the School of Business, the School of Education, the School of Engineering, the School of Forestry, the School of Home Economics, the School of Nursing, the School of Pharmacy, the School of Veterinary Medicine, and the Graduate School.

Auburn University at Montgomery offers the baccalaureate and the master's degrees.

On the Auburn campus, military instruction is available in Air, Military, and Naval Science basic and advanced programs.

Liberal Education Program

The University's instructional program for undergraduates specifies that students complete a component of general studies in addition to the requirements of their School or departmental major: this general work covers a foundation year of courses in English composition; world history, art history, or literature; natural science; mathematics or philosophy; and physical education; and is to be taken during the lower-division years, primarily at the freshman level. A certain number of hours must also be completed in elective courses lying outside students' major area, these to be taken, in part at least, during the upper-division years.

The goals of this "experience in breadth" are to some extent intangible: the development in students of the values of tolerance, intellectual honesty, and a capacity for reflective judgment. More specifically, it is hoped that students will acquire also an ability to order their thoughts in a clearly expressed and reasoned manner; attain a grasp of the scientific method and discipline; develop some understanding of their culture and its backgrounds; and come to perceive the vital issues of our common life as citizens in a complex and changing world.

The minimal University requirements for all students are listed below; however, they should consult the appropriate curriculum model in their School for complete requirements.

Requirement	Hours	Option
English Composition EH 101-102-103 (3-3-3)	9	
History or Literature	9	World History 101-102-103 (3-3-3) or Technology & Civilization 204-205-206 (3-3-3) or World Literature (EH) 260-261-262 (3-3-3) or Art History 171-172-173 (3-3-3)
Natural Science	minimum of 10	Biology 101-102-103 (5-5-5) 105-106 (5-5) 105-107 (5-5) Chemistry 103-104 (5-5) 101-102-104 (2-3-5) Geology 101 (5), 102 (5), 103 (5), 110 (5), Physics 205-206-207 (4-4-4) Physical Science 100-101 (5-5)
Mathematics or Philosophy	minimum of 5	Mathematics 100 (5), 140-161 (5-5), 151-161 (5-5) 160-161 (5-5) Philosophy 111 (3), 202 (5), 210 (3), 211-212 (3-3), 214 (3), 216 (3)
Electives or Area Requirements	minimum of 20	Additional hours of liberal education studies will consist of coursework in two broad academic areas other than that in which the student's own major field lies (Humanities and Fine Arts, Social Sciences, Math- ematics and Natural Science), with no less than one course in each area.

Freshman English Composition Requirements

Credit in freshman English composition earned at another institution may be allowed on transfer as follows, except that no grade less than C will be accepted.

If transfer students have been exempted from freshman English composition at another institution and have had no subsequent coursework in freshman composition, they must still complete Auburn's nine-hour requirement. However, they may take the English Department's Advanced Standing examination for possible exemption with credit for part

or all of that requirement. This exam is normally administered on the first day of final registration just before each quarter; check with the English Department for the date, place, and time.

If transfer students have been exempted with credit from part of a freshman composition sequence at another institution and have earned a grade of C in subsequent coursework in composition there, they will be allowed credit for the coursework but (depending on the number of hours still needed) will be required to complete EH 103 or EH 102 and 103. In other words, students must complete the freshman English requirement by taking the last course or last two courses in the Auburn sequence. This does not constitute course duplication.

If transfer students have been exempted with credit from part of a composition sequence at another institution and earned an A or B in subsequent coursework there, then both the exemption credit and the course credit will be allowed. If transfer students have been exempted without credit and have earned an A or B in subsequent coursework there, then the course credit will be allowed and, in addition, they will be awarded sufficient Advanced Standing credit to fulfill Auburn's freshman English requirement. This credit will be awarded through the Registrar's Office.

If at another institution transfer students have made a grade of D in an earlier course in freshman English and a C or better in a subsequent course, they are required to take the last course or the last two courses in the Auburn sequence. For example, students who at another institution made a D in EH 101 and a C in EH 102 will be required at Auburn to take either EH 103 or EH 102 and 103, depending on the number of hours they need to complete Auburn's nine-hour requirement. This does not constitute course duplication.

If the transfer students have fewer than three quarter hours of credit in freshman English composition, no credit is allowed. If they have three quarter hours credit in the first course of an English composition sequence, they must complete both EH 102 and EH 103.

If transfer students have four quarter hours of credit in the first course of a three-course sequence, they must complete EH 102 and 103.

If transfer students have either four or five quarter hours of credit in the first course of a two-course sequence, they must complete EH 103.

If transfer students have three semester hours of credit in the first course of a two-course sequence, they must complete EH 103.

If transfer students have earned eight or more quarter hours and have met the first year English composition requirement of the other institution, credit may be allowed for EH 101-102-103, provided the minimum of eight hours involves no duplication. A total of 12 hours may be accepted toward the graduation requirement when the 12 hours of work represents a continuous course sequence at one school.

No student failing a freshman English composition course at Auburn will be permitted to transfer credit from another school to offset that F, but must repeat the course in residence at Auburn (Auburn campus). Furthermore, the student must take all subsequent required freshman composition courses at Auburn (Auburn campus).

Students entering an undergraduate school at Auburn University after receiving a bachelor's degree from another accredited college or university are exempted from meeting these regulations. Persons who have questions about placement or credit which are not covered in this statement should talk to the Director of Freshman English [205-826-4820].

All transfer students should clear their freshman English composition credits with the Registrar as soon as possible after enrolling at Auburn University.

History—Literature Requirements

One of the purposes of the University's Liberal Education Program is to give students an understanding of their culture and its backgrounds. Course sequences designed especially for this purpose are those in world history, world literature, technology and civilization, and art history. Students must earn nine hours of credit in one of these sequences.

Credit in history or literature earned at another institution may be allowed on transfer as shown below in meeting this particular requirement. The student's dean may require a C grade for a course to transfer.

1. If transfer students have three or four quarter hours of credit in the first course of a three course sequence in history or literature, they must complete HY 102 and 103, HY 205 and 206, AT 172 and 173, or EH 261 and 262.
2. If transfer students have four or five quarter hours of credit in the first course of a two course sequence, they must complete HY 103, HY 206, AT 173, or EH 262.
3. If transfer students have earned eight or more quarter hours in a history or literature area and have completed the standard history or literature requirement of the other institution, they may be excused from this particular requirement in the Liberal Education Program.
4. If students enter an undergraduate school at Auburn after receiving bachelors' degrees from other accredited universities, they may be exempted from the history-literature requirements unless their curriculum majors or minors specify one of the four sequences described in this section.

The Honors Program

Entering freshmen with extraordinarily high academic aptitudes are eligible for consideration for admission into the University Honors Program. Basic requirements are (1) an ACT composite of 29 or higher or an SAT total of 1250 or higher and (2) a high school grade point average of 3.5 or higher. Students with lower scores than these are eligible for consideration if they score very high on one or more sections of the ACT or SAT. The University

Honors Program includes students in the School of Arts and Sciences, School of Engineering, School of Architecture and Fine Arts, School of Business, School of Education, School of Home Economics, School of Nursing, and School of Agriculture, Forestry, and Biological Sciences.

The Honors Program provides a group of honors courses in the freshman and sophomore years, individual learning opportunities in the place of some conventional course work in the junior and senior years, the writing of an honors thesis, and the possibility of accelerated entry into work on a master's degree. Successful completion of the Honors Program with a minimum overall grade point average of 3.4 is recognized by notation on the student's diploma and permanent record.

Libraries

The Ralph Brown Draughon Library is the main library; branches are maintained in the School of Architecture and Fine Arts, School of Veterinary Medicine, and on the first floor of Haley Center.

Current holdings include over 1,274,493 bound volumes and 1,539,168 items in microformat. The library is a depository for government documents and lists among its serial subscriptions more than 10,230 periodicals and 180 newspapers. Special collections include an Alabama Collection, 99,821 maps and other special materials.

Library staff members offer assistance in the location and use of library materials at the General Information and Humanities Desk, and at desks in the Social Sciences Department, Science and Technology Department, Special Collections, and the Microforms and Government Documents Department. Desks are also maintained in the three branch libraries.

A convenient open-shelf arrangement of the main collection makes material readily accessible. Comfortable, well-lighted study areas are available, including carrels which graduate students and faculty may reserve.

Archives

The Archives was established in 1964 and now has over 750 University and personal manuscript collections; 1,300 oral history and recorded sound tapes; approximately 100,000 prints and negatives; and 900 rolls of microfilm available for research use. The Archives operates the Records Management and Micrographics programs for the University.

Division of University Computing

University-wide academic and administrative computing services are provided by the Division of University Computing. The Division has three component units: Computer Center, Information Systems and Academic Computing Services.

The Computer Center operates mainframe computing equipment in support of Instruction, Research, Extension, and Administration. An IBM 3033 computer handles academic computing, and administrative processing is handled by an IBM 3032. Remote sites, both interactive and batch, are provided in several locations around campus. Graphics facilities for computer-aided-design and data presentation are provided on the IBM 3033, in addition to capabilities for text processing, statistical analysis, simulation and programming. A data base management system and an office automation system are available on the IBM 3032. All requests for use of these mainframe computers are initiated through heads of academic and administrative departments. Request forms are available in 144 Parker Hall.

Information Systems provides system analysis, programming and data reporting services in support of University administration.

Academic Computing Services serves as the liaison to the academic community and coordinates the use of the academic mainframe (IBM 3033). The minicomputer facility, containing two VAX 11/750s and a PDP 11/70, and a microcomputer lab, with 30 IBM PCs, are provided by Academic Computing in support of instruction. User services, such as consulting, training, documentation, technical support and a newsletter, are provided to faculty and students on all academic computers through this unit.

The Division of University Computing is a service organization, and does not conduct an academic program, although some staff members participate as faculty in these programs. Inquiries concerning computer curriculums should be directed to the Dean of Engineering or the Dean of Business; some information is contained in this catalog pertaining to these programs.

Revenues

Auburn University receives financial support from student fees, state and federal appropriations, endowments, income from clinical services, sales, gifts, grants, contracts, and other sources. The largest single source of income is state appropriations.



Student Affairs

THE DIVISION OF STUDENT AFFAIRS, under the direction of the Dean of Students, administers services and programs for students, faculty, staff, and alumni. Areas of involvement of this division include Admissions, Career Development, Financial Aid, Food Services, Foy Union Building, Housing, Recreational Services, Registrar, Student Health Services, Student Activities, and Student Information systems.

Admissions

Auburn University is an equal opportunity educational institution and, as such, does not discriminate in its admissions policy on the basis of race, color, sex, creed, handicap, age or national origin. Preference is given to the admission of Alabama residents at the undergraduate level; in considering applications to professional schools or programs with restrictive admissions policies, the length of residency in the state will be a factor.

Applications from out-of-state residents will be accepted for all curricula; however, the number of nonresidents who are admitted will be determined by the availability of facilities and faculty.

Application to any undergraduate school or curriculum of the University must be made to the Admissions Office, Auburn University, Alabama 36849. Application forms and instructions can be obtained from the Admissions Office. Application to the Graduate School or the School of Veterinary Medicine must be made to those schools.

Individuals may apply for entrance to any quarter of a calendar year as early as August 15 of the preceding year.* Because of the large number of applications, credentials should be submitted at the earliest possible time. In all cases, complete credentials along with the physical examination report must be filed at least three weeks before the quarter's opening. The University reserves the right to establish earlier deadlines should circumstances warrant such action.

A \$15 processing fee must accompany all admission applications and is neither refundable nor applicable to other fees. Responses on the application forms and on related materials must be complete and accurate; entrance may be denied or registration cancelled as a result of false or misleading statements.

Applicants may receive provisional acceptance after they submit the application form and current academic documents. However, they must complete and return a medical examination report at least three weeks before the quarter opens. The University provides the medical report form; it also may require additional medical examinations if such appear advisable, and it may refuse admission to any individuals whose health records indicate that their health or the University community might be adversely affected by their attendance.

Each applicant must furnish satisfactory evidence of good character. The University may deny admission to those whose presence is deemed detrimental to the institution or its students.

Admission of Freshmen

Enrollment limitations for freshmen have been established by curricula and schools, in proportion to available faculty and facilities. Favorable consideration for admission will be given to accredited secondary school graduates whose college ability test scores and high school grades give promise of success in college courses.

All secondary school students planning to apply for admission to Auburn should emphasize the following high school courses: English, mathematics, social studies, sciences, and foreign languages. A minimum of 16 high school units is required for admission. Four of these units may be vocational subjects.

Applicants are required to present scores from either the American College Test (ACT) or the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board. High school students may secure application forms from their principals or counselors. Scores on these tests are used as a partial basis for admission, for placement in English, chemistry, and mathematics, and for awarding University scholarships and loans.

Prospective freshmen who take the ACT and SAT, list Auburn as a score recipient and meet freshman entrance requirements will be mailed a preprinted application completed from information supplied to the testing service by the student.

*Applicants to Veterinary Medicine will be admitted in the Fall Quarter only. See page 185.

At least one unit of college preparatory mathematics (algebra or geometry) is required for admission to any curriculum in the University. Curricula which list Mathematics 140 or 160 assume the student's competence in the mathematics taught in high school geometry and second year algebra. Curricula which list MH 161 as a first college course in mathematics presume, additionally, competence in high school "analysis" (the function concept, graphs of functions, the trigonometric functions).

A deficiency in the latter material can be remedied by taking MH 160. However, Auburn University offers no course comparable to high school geometry or to first and second year high school algebra. MH 140 can serve as a refresher course, but credit is not allowed for both 140 and MH 160. MH 100 is not a preparatory course for any of the above college-level courses.

Applicants whose native language is not English may be required to demonstrate proficiency in English.

Applicants of mature age who are not high school graduates may be considered for admission if their educational attainments — through testing — are shown to be equivalent to those of a high school graduate. The tests used include the USAFI General Educational Development Test, the American College Test and/or other tests recommended by the Admissions Committee. Applicants from nonaccredited high schools will be considered on an individual basis by the Committee.

Early Admission — Students of high academic promise may be admitted directly from the eleventh grade without a diploma. Basic requirements for early admission include:

1. Proper personal qualifications.
2. Superior competence and preparation, evidenced by the high school record and college aptitude test scores (ACT, SAT or other tests prescribed by the University Admissions Committee).
3. A letter from the high school principal assessing the applicant's emotional and social maturity, and readiness for college work.

Additional information on procedure is available at the Admissions Office.

Advanced Standing — Students with superior preparation may be placed in advanced programs suited to their ability and academic background. Individuals with special competence may qualify for advanced placement or credit on the basis of high school grades, scores on college ability or achievement tests, the College Level Examination Program (CLEP) tests, proficiency tests, and military courses. See page 28.

Admission of Transfer Students

For residents of Alabama or other states who are party to the Southern Regional Education Board*, a satisfactory citizenship record, an overall C average (2.0 on a 4.0 system) or better on all courses attempted, and eligibility to re-enter the institution last attended are required for transfer admission. Residents of states not affiliated with the SREB must present at least a B average in addition to the other requirements. Entrance examinations may be required of applicants transferring from colleges with which the University has had little or no experience.

Applicants who were not eligible for admission to the University when they graduated from high school must present a minimum of 48 quarter hours or 32 semester hours of college credit with C's or better in college-level English composition courses to qualify for consideration as a transfer.

The School of Engineering limits enrollment of students to its various curricula. In addition to the minimal criteria, students must be recommended by the Curriculum Admissions Committee. Students must be recommended by the Curriculum Admissions Committee after meeting the minimal criteria. These criteria include an overall average of 3.2 for Computer Science and Computer Engineering, 2.8 for Chemical Engineering, 2.0 for Textile Management and Technology, and 2.5 for all other curricula. Mathematics requirements include the completion with a grade of C or better of the first mathematics course listed in the chosen curriculum.

Transfer Credit — The amount of transfer credit and advanced standing allowed will be determined by the appropriate dean and the registrar. The dean will determine acceptance of D grades; credit in freshman English is allowed only on grades of C or better. See page 11. The maximum credit allowed for work completed in a junior college will not exceed the number of hours required in the first two years of the student's curriculum at Auburn.

Students transferring from unaccredited institutions or programs may be granted provisional credit. When such credit is allowed, the final amount of credit will be determined upon completion by the student of one year of course work at Auburn University. If a C average is not achieved, the amount of credit will be reduced in proportion to the number of hours in which the student fails to earn a C average or better.

Transfer Within the System

Auburn University maintains a campus at Montgomery, Alabama. An undergraduate enrolled at either of Auburn's campuses who wishes to transfer to the other campus will be considered as a transfer student from any other accredited college. Because there is a slight difference between some curricula and courses at the two institutions, transfer credit and advanced standing will be determined by the academic unit and the registrar at the campus to which the student is moving.

Admission of Transient Students

A student in good standing in an accredited college may be admitted to the University as a transient student when faculty and facilities are available.

To be eligible for consideration, an applicant must submit an application, an acceptable medical report and a letter of good standing bearing the signature of the dean or registrar of the college in which the applicant is currently enrolled.

Permission to enroll is granted for one quarter only; a transient student who wishes to re-enroll must submit a new application. Transient status does not constitute admission or matriculation as a degree candidate. The transient is, however, subject to the same fees and regulations as a regular student except for the continuation-in-residence requirements.

Admission of Unclassified Students

For residents of Alabama and other states affiliated with the Southern Regional Education Board, admission to undergraduate programs as an Unclassified Student may be granted on the basis of the bachelor's degree from an accredited college. For residents of states not affiliated with the SREB, Unclassified Student enrollment may be allowed on the basis of the bachelor's degree and an overall B average. Unclassified students must submit the same admissions credentials as transfer applicants.

Admission of Special Students

Persons who cannot meet freshman admission requirements but who are otherwise adequately prepared for University courses may be admitted as special students on approval of the Admissions Committee and the dean concerned. Course credits earned by special students generally cannot be used toward a degree at Auburn University.

Admission of International Students

The University welcomes admission inquiries from international students. Because of limited facilities, however, only those students who are academically strong will be given serious consideration for admission. Also, the international student should be proficient in English. In all cases, English proficiency is determined by satisfactory results on the Test of English as a Foreign Language (TOEFL), offered by the Educational Testing Service, Box 899, Princeton, N.J., 08540, U.S.A. The student must submit satisfactory results on the Scholastic Aptitude Test of the College Entrance Examination Board, also offered by the Educational Testing Service.

International students first should send all of their academic credentials to the Admissions Office for evaluation. If they appear to be qualified, and show promise of success in their chosen fields of study, they will then be asked to make formal application. The application must be accompanied by a recent photograph and an application fee of \$15 (not refundable). If the applicants present satisfactory academic credentials, test results, and evidence that they have sufficient funds to meet their college expenses (there is no financial assistance for undergraduate international students), they will then be sent an acceptance and the form I-20, the authorization for a student visa. All international students are required to subscribe to Plan II of the student insurance plan or provide evidence of equivalent coverage. Information about student insurance is available at the Drake Student Health Center. For further information, prospective students should write to the Admissions Office, Auburn University, Auburn University, Alabama 36849-3501, U.S.A.

*The fourteen states participating in the Southern Regional Education Board's compact are Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

Admission of Auditors

When faculty and facilities are available, an individual who does not seek admission for course credit may audit a lecture course or the lecture portion of a course upon approval by the Admissions Office, the dean, and the head of the department involved. A formal application must be filed, but the \$15 application fee and the physical examination report are not required. (See Auditing Privilege, page 23.)

Admission to Graduate Standing

Admission to graduate standing is granted only by the University Graduate School. A \$15 application fee is required. A bachelor's degree or equivalent from an accredited college or university and submission of satisfactory scores on the Aptitude Test of the Graduate Record Examination are required for Graduate School admission. Applicants for admission to doctoral programs must submit Advanced Test scores also. Certain departments require applicants to master's degree programs to take the Advanced Test.

The undergraduate preparation of each applicant must also satisfy the requirements of a screening committee of the school or department in which the student plans to major. A student in good standing in a recognized graduate school who wishes to enroll in summer session, off-campus workshop, or short session, and who plans to return to his former college, may be admitted as a graduate transient. For further information, see the section on the Graduate School and also the Graduate School Bulletin.

Readmission

Students who have previously attended Auburn and who wish to re-enter must secure a registration permit from the Registrar's Office. Former students who have attended another college for at least one quarter or semester must be eligible to re-enter that institution, if they desire to return to Auburn. Students who attended another institution for more than one quarter must have earned an overall C average or better since last attending Auburn to be eligible to re-enter Auburn. Two transcripts from the institution attended must be supplied to the Registrar.

Pre-College Counseling

In order to help entering freshmen and transfer students choose fields of study, and to adjust to their first quarter at the University, Auburn provides pre-college counseling.

Freshmen entering Fall Quarter attend counseling sessions on campus during the summer prior to entrance. In these sessions, students meet faculty members, administrators, and student leaders, and plan with their advisers a schedule of their first quarter of college work.

Freshmen entering the University any quarter other than Fall Quarter are usually required to report to campus one day early for counseling.

Transfer students may meet with advisers during the regular pre-registration period for the quarter in which they plan to enroll. Transfers will plan their schedules after their transcripts have been evaluated. A convocation for all transfer students is held on the first day of registration prior to the beginning of classes.

Alabama and Non-Alabama Student Policy

For the purpose of assessing fees, applicants shall be classified as Alabama or non-Alabama students. Non-Alabama students are required to pay a tuition fee.

An Alabama student is a person who shall be a citizen of the United States or a resident alien and who shall have resided and had habitation, home, and permanent abode in the State of Alabama for at least 12 months immediately preceding current registration. In applying this regulation, "applicant" shall mean a person applying for admission to the institution if applicant is married or 19 years of age, or, otherwise, it shall mean parents, parent or legal guardian of his or her person. If the parents are divorced residence will be determined by the residency of the parent to whom the court has granted custody. A student shall be classified as an Alabama student when parent(s) or legal guardian establishes domicile within the state and is employed full-time in a permanent position in the state.

In the determining of an Alabama student for purposes of assessing fees, the burden of proof is on the applicant. An applicant can change status from non-Alabama to Alabama student only by actually and physically coming into the state for the required period with the intention of residing within the state.

A non-Alabama student may apply in writing for reclassification prior to any subsequent registration. To qualify for reclassification as an Alabama student, the applicant (1) shall present evidence of having resided in Alabama for 12 consecutive months preceding request for reclassification, (2) shall submit evidence that subject has met the usual and expected obligations of an Alabama citizen, and (3) shall file a declaration of intent to reside in Alabama. An alien shall have resided in Alabama for 12 months and must present U.S. Immigration and Naturalization certification that he or she is a resident alien. If the application is supported by evidence satisfactory to the University that the student then qualifies as an Alabama student, the classification may be changed for future registrations.

Members of the Armed Services and their dependents stationed in Alabama, unless specifically for civilian educational purposes, will be granted resident status. Dependents of members of the Armed Services stationed outside Alabama will be granted resident status if the parent or guardian in the Armed Services has an Alabama Home of Record. Furthermore, members of the Armed Services with an Alabama Home of Record who enroll in the University while on active duty or within a one-year period after leaving active duty will be granted resident status. Documentation is required and the Alabama Home of Record must be attested to by military authority for a minimum period of one year before the entry of the student.

The registrar shall have the responsibility for determining whether a student shall be classified as an Alabama or non-Alabama student. The decision of the registrar shall be subject to review by the President or his designated representative upon written request of the applicant.

Fees and Charges

Auburn University's fees have remained somewhat lower than those charged by similar institutions in the Southeast and in other sections of the country. As institutional costs have risen, small increases in fees have been authorized from time to time by the Board of Trustees. Every effort is made, however, to hold fees and charges at a minimum.

The following fees and charges are in effect at this time. However, since the catalog must be published well in advance of the next school year, it is not always possible to anticipate changes. **Thus the fee schedule may have to be revised. Every effort will be made to publicize changes as far in advance as possible.**

Payment of Fees and Charges — Students are expected to meet all financial obligations when they fall due. The University reserves the right to deny admission to or to disenroll and withhold transcripts of any student who fails to meet promptly his financial obligations to the University. It is each student's responsibility to be informed of all registration and fee payment dates, deadlines, and other requirements by referring to the official calendar of events in the catalog, announcements printed in the *Plainsman*, or disseminated by other means from time to time. Where necessary, students should inform their parents of the deadline dates, and the necessity of meeting them.

Checks — Checks given in payment of fees and charges are accepted subject to final payment. If the student's bank does not honor the demand for payment and returns the check unpaid, the student will pay the applicable late penalty fee of \$10 or \$50. If payment is not cleared promptly, the student's registration will be cancelled.

Veterans — Veterans enrolled under the federal GI Bill's P.L. 358 and P.L. 634 receive their allowances directly from the Government and are responsible for paying their fees and charges on the same basis as other students. This does not apply to P.L. 894 or P.L. 815.

Any collection costs or charges with all attorneys fees necessary for the collection of any debt to the University will be charged to and paid by the debtor. Questions about charges or refunds should be addressed to the Assistant Treasurer.

Foreign Students-Under Contract — For those foreign students who come to the University under a contractual arrangement that requires special administrative and programming arrangements beyond those of the regular academic program of the University, a special administration/management/program fee will be negotiated.

Basic Quarterly Charges

Students should be prepared to complete registration by payment of fees and charges, upon notice, two to three weeks before the beginning of the quarter. See fee payment dates in the Calendar, pages 6-7.

A. Graduate & Undergraduate	Ala. Students	Non-Ala. Students*
1. University Fee — 10 or more credit hours (all except Vet. Med.) (a.)	365.00	835.00
2. University Fee — Veterinary Medicine (a.)	465.00	1,065.00**
3. Part-time Registration Fee (Less than 10 hours) (b.)	55.00	120.00
4. Part-time Credit Hour Fee (Less than 10 hours) (b.)	31.00	71.00
5. Auditing Fee (c.)	31.00	71.00
6. Clearing for Graduation Fee (d.)	55.00	120.00
7. Doctor of Pharmacy Fee (e.)	100.00	100.00
8. Music Fee (per applied course)	45.00	45.00
9. Field Laboratory Courses — Off Campus Program		
(a.) Service Fee	55.00	120.00
(b.) Additional Fee Per Credit Hour (g.)	31.00	71.00
10. Correspondence Study Course Fee (h.)		
a. Service Fee	10.00	10.00
b. Additional Fee Per Credit Hour	21.00	21.00

*Non-Alabama fees shall not apply to Graduate Teaching Assistants, Graduate Research Assistants and Graduate Assistants, on a one-fourth time or greater appointment in the University. These shall pay fees as Alabama students.

(a.) The University Fee is used to meet part of the cost of instruction, physical training and development, laboratory materials and supplies for student's use, maintenance, operation, and expansion of the physical plant, Library, Student Health Services and Student Activities.

The Student Activities portion of the fee supports such activities on campus as intercollegiate athletics, exhibits, GLOMERATA, intramural sports, PLAINSMAN, religious life, social affairs, student government, student union activities and operations, TIGER CUB, and WEGL Radio Station. This fee includes 25 cents held in reserve to cover unnecessary damage to University property by students.

(b.) Students registering for fewer than 10 credit hours will pay the Part-Time Registration Fee plus the Credit Hour Fee for each credit hour. (Students who register for 10 or more hours will pay the University Fee.) The Part-Time Registration Fee is remitted to full-time faculty and staff taking no more than five credit hours. All students except faculty and staff are eligible to participate in Student Health Services and Student Activities.

(c.) Any student who pays less than full fees must pay this fee for auditing a course. (Not charged to faculty and staff.)

(d.) A student who is a candidate for a degree in a quarter in which no credit work is taken is required to register in such quarter as a prerequisite to graduation. (For members of the faculty and staff the charge shall be reduced to \$5.00.) Graduation fee is to be paid in addition to this charge.

(e.) Extra fee per quarter — Clinical Pharmacy.

(f.) This additional music fee to be paid at the time of registering for each Performance Course of individual instruction. Instruction is available in one hour or two half-hour lessons per week.

(g.) Students registering for off-campus courses (Field Laboratory Courses) will pay the Service Fee plus the additional fee per credit hour.

(h.) Students registering for Correspondence Study Courses will pay the Service Fee plus the additional fee per credit hour.

**Only \$465 for SREB students.

Other Fees & Charges

Fee for the Late Registration or Late Payment	\$10.00-50.00
All students, regardless of classification, must clear fees and tuition by the deadline set by the University, or pay the following additional charges which are not refundable:	
a. Through official schedule adjustment period.	10.00
b. Effective the first through fifth day of classes	20.00
c. Effective the sixth through tenth day of classes	30.00
d. Effective after tenth day of classes	50.00
Reinstatement/Re-enrollment Fee (After Disenrollment)	50.00
Achievement Certificate Fee	10.00
Application Fee	15.00
The application fee must accompany all applications for admission. Not refundable nor applicable to registration fees. (See section on Admissions.)	
An application fee must accompany the application for housing and is not refundable or applicable to housing fees. (See section on housing.)	
	15.00
Change in Course fee	10.00
Charge is made in cases where student is not required or advised by the University to change, but has the Dean's permission to do so after Schedule Adjustment period.	
Change in Curriculum Fee (if change made after classes begin)	10.00
Chemistry Lab Fee (not refundable after 12th class day)	20.00
Duplicate Diploma Fee	15.00
Doctoral Dissertation Microfilming Fee	40.00
Equivalency Examination Fee (GED) (each)	20.00
Graduate Thesis and Dissertation Binding Fee (per copy)	7.00
Three to five copies usually required.	
Graduation Fee (each degree)	15.00
Payable at beginning of the quarter in which the student expects to receive a degree. Deadline — two weeks before Graduation (transferable to next quarter or refundable if student fails to qualify).	
Cap and Gown Rental Fees (for Graduation Exercises)	
(includes retaining of tassel)	
Bachelors — cap and gown	8.35
Masters — cap, gown, and hood	17.20
Doctorate — cap, gown, and hood	18.50
Agricultural Internships AEC 399, ADS 495, AY 390, FAA 315, HF 330, PH 402, ZY 490, 491	
Criminal Justice LE 464	
Foreign Language International Trade Internship FL 499	
Journalism Internship JM 425	
Political Science Internship PO 450	
Speech Communication 539, CD 658, CD 668	
Fees will be one-half the full University Fee and one-half of the non-Alabama student fee if applicable. Total course load not to exceed 9 credit hours.	
Music Fees	45.00
This additional fee to be paid at the time of registering for each Performance Course of individual instruction. Instruction is available in one hour or two half-hour lessons per week.	
Rent for Single Student Housing, per quarter (see housing)	215.00 to 420.00
Rent for Caroline Draughon Apts., per month (see housing)	185.00 to 255.00
Meal Plans (See section on Food Services under Student Services and Programs.)	
Quarterly meal up to (plus tax)	400.00 to 500.00
ROTC Uniform and Equipment Deposit (Air Force)	40.00
All students, both Basic and Advanced, are required to deposit the sum of	

\$40 with the University Bursar, prior to enrollment in ROTC, except for Army and Naval ROTC. The deposit is refunded to the student on completion of the program or withdrawal therefrom and the return of the uniform and other supplies.

Service and Penalty Charges

Registration fees billed home,

To parents, to Trust Funds, to companies, or other sponsors	5.00
Charge for returned check	10.00
Failure to pay fees due or to make returned check good on notice where two or more notices are required	10.00 or 20.00
Notice: CHECKS ARE ACCEPTED SUBJECT TO COLLECTION	

Special Service Fees

Cooperative Education Program	15.00
Internship Fee-Veterinary Medicine	15.00

Transcript Fee

3.00

Registration Fee Cancellations or Refunds

If the student who has paid fees before the opening of the quarter officially resigns *prior* to the beginning of the quarter, all fees except late fees will be refunded. If the student resigns within the first 12 days of classes, all fees less charges will be refunded except the sum of \$75 for handling. Also if the student has used the University Health Service during that quarter, the \$20 Health Services Fee will be retained. No refunds will be made in case of withdrawals or drops after 12 days of classes except in cases of resignation caused by personal illness (physician's statement required) or call into military service (copy of activation orders required). Students suspended for disciplinary reasons are not eligible for refund or cancellation of accounts due.

If student received student aid in the form of a scholarship, grant, or loan, any refunds due would be applied back to the student aid fund.

Academic Regulations

Registration and Scheduling

Every student who makes use of the instructional staff and facilities of the University must register and pay fees. This rule also applies to students who are clearing incomplete grades, clearing for graduation, or working on graduate theses. The University Calendar on pages 6 and 7 lists the dates for registration, schedule adjustment and distribution, fee payment, and final registration. The student's dean authorizes and approves the subjects for which the student registers, as well as any changes or adjustments in his schedule. Courses should be scheduled in sequence as they appear in the curriculum model.

Students are urged to register during the computer-assisted registration held in the quarter preceding the term for which they are registering. A currently enrolled undergraduate who fails to do so is charged a late fee. Fall Quarter schedule distribution and fee payment are accomplished by mail in September. A final registration is held one to two days before the first day of classes.

When registering, the student is responsible for observing the prerequisites or co-requisites of courses. Any waiver of these requirements must be approved by the instructor and/or his department head. Also, waiver of the junior standing prerequisite for courses that may be taken for graduate credit must have the Graduate School dean's approval.

Late registration must be authorized by the student's dean, and a late fee will be charged. A student's class load may be reduced by the dean. No student will be registered after the tenth day of classes without the approval of the Vice President for Academic Affairs.

Course credit completed at another college or university while the student is concurrently enrolled at Auburn University will not be counted toward his degree without prior permission from the dean.

Registration and Readmission Permits

Entering freshmen and first-quarter transfer students obtain permits to register from the Admissions Office. Previously enrolled undergraduates secure their permits from the Office of the Registrar; graduate students receive theirs from the Graduate School.

A student seeking readmission who has attended another college since being enrolled at Auburn University must (1) be eligible to re-enter the last institution attended and (2) have a C average overall on course work attempted at other colleges attended two or more terms. Two official transcripts from each institution attended must be furnished to the Registrar's Office.

Change of Major or Curriculum

Students must have their dean's approval to change to another major within the same School. To change Schools within the University, a permit from the Registrar's Office is required.

Course Load

The maximum load for students in undergraduate curricula is 19 quarter hours. A normal load is 15-19 hours per quarter. With their dean's approval, students may schedule less than a normal load.

The maximum load may be exceeded under the following circumstances:

1. The academic dean may approve up to 20 hours as a convenient load.
2. On approval of their dean, students may schedule overloads not to exceed 23 hours if, during their last residence quarter at Auburn University in which they carried 15 or more hours, they passed all work attempted and earned a grade point average of 2.5 or higher. Students who have scheduled fewer than 15 hours during an intervening quarter (or quarters) will retain the overload privilege if all work carried was passed with a minimum grade-point average of 2.5 in each intervening quarter. In special cases the dean may make exceptions to the 2.5 requirement, by written notice to the Registrar.
3. On approval of their dean, graduating seniors who are ineligible to carry an overload may schedule a maximum of 23 hours if the overload will allow them to graduate in that quarter.

Students who register for work in excess of the approved load may be required by the dean to drop the overload during the Schedule Adjustment period.

Curriculum Model Change

When the University changes a curriculum model, students in the altered curriculum may be required to complete the subjects and hours placed above the level to which they had progressed. They will not, however, be required to complete additional subjects placed in the curriculum below the level they had achieved. Courses shifted from one class level to another are exempt from this latter provision. Students' deans will determine the revised subject requirements, and the Registrar will determine the revised total hour and grade-point requirements. In no case, however, will the changed curriculum compel students to accumulate additional hours and grade points in order to graduate.

Classification

The undergraduate's classification will be determined by the number of credit hours earned at Auburn and elsewhere.

<i>Freshman</i>	47 or fewer quarter hours
<i>Sophomore</i>	48-95 quarter hours
<i>Junior</i>	96-143 quarter hours
<i>Senior</i>	144 or more quarter hours

The numbering sequence for identifying the classification of students is as follows: 1, Freshman; 2, Sophomore; 3, Junior; 4, Senior; 5, fifth year for Pharmacy, Architecture, and Veterinary Medicine; 10, Unclassified (non-degree students); 12, Special and Transient students and auditors only; 6, 7, 8, 9, 11, 13, and 14 are Graduate student classifications.

A student with a baccalaureate degree who undertakes a program for a second bachelor's degree will be classified as an undergraduate.

Auditing

Auditing of courses is restricted, and rarely permitted in laboratory courses. A student's audit privilege is granted only on the approval of the dean and the head of the department of the course involved.

Auditors not previously admitted to the University must be approved for registration by the Admissions Office. They must register and pay appropriate fees. Although listed on class rolls, auditors are not required to take part in classroom discussion, tests, examinations, or reports. They will receive no grade or credit; however, a student who does not attend or attend regularly the audited course will have "non-attendance" indicated by the course on his records.

Students may not change from audit to credit after classes begin, but may change from credit to audit within the first three weeks of classes. No refund of fees will be made except for changes made during the first two weeks of classes in accordance with University policy.

Class Attendance

The University regards the final grade for a course as a measurement of the student's performance in achieving the objectives of the course. Absence from class sessions, in and of itself, should not determine, though it may well influence, the final grade in advanced courses. With respect, however, to 100-level and 200-level courses, the departments concerned may adopt such absence policies as they deem appropriate, and these shall be presented to each class, preferably in writing, at the beginning of the quarter.

The student shall be expected to carry out all assigned work, including laboratories, and to take all examinations at the class period designated by the instructor. Normally it is difficult to make up laboratories; therefore, the student must attend laboratory sessions during the times for which he or she is registered. Failure to carry out these assignments or to take examinations at the designated times will result in an appropriate reduction in grade, except as provided in the following paragraphs:

Each instructor shall determine the policy regarding assigned work which he or she feels is best for the course. In developing this policy the instructor shall consider carefully the nature of the course, the maturity level of the students enrolled in the course, and the consequent level of flexibility which the policy will include. The policy, along with the instructor's requirements for announced and unannounced examination attendance, shall be presented to the class, preferably in writing, at the beginning of the quarter and will govern the actions of the instructor in the course.

Instructors will be expected to recognize and honor official University excuses which may be issued to groups or individuals for absences due to participation in authorized University activities (athletic teams; events of a traditional nature such as the Hutsell Freshman Cake Race; or for absences directly related to the academic program such as authorized field trips*), and to make allowances for student absences caused by illness or personal emergencies. Absences from classes (with the exception of laboratories and classes which meet only once a week) between the hours of 3 and 6 p.m. on the day of the Wreck Tech parade and the Wilbur Hutsell ODK Freshman Cake Race will be excused for freshmen, members of the band, and cheerleaders. Arrangements to make up missed work shall be initiated by the student. Such arrangements could result in delayed due dates for assignments, or an incomplete or other deferred grades.

Excuses for student absences of a nonacademic, extracurricular nature will not be issued by the University but will be granted at the discretion of the individual instructor. Any evidence or request for consideration that the student may feel justifies his or her absence may be presented to the instructor for review.

Excuses for the purpose of attending reserve military training are normally denied.

The regularly accepted time for class procedure to begin shall be 10 minutes after the hour. If the instructor does not appear within 20 minutes after the hour, it may be assumed that the class is cancelled. All classes shall be dismissed promptly on the hour.

In order that the University may have effective class days, it is University policy that all classes will meet as scheduled the last day before holidays and the first day after holidays as designated by the University.

Unresolved problems may be referred to the office of the Vice President for Academic Affairs for resolution.

*Field trips will be authorized by the department and dean of the School in which the course is taught. The instructor will issue an official excuse to each student participating in the field trip. Any student may decline participation in a given field trip and receive an appropriate compensating assignment if, following consultation with his instructor, it appears that the field trip would adversely affect his other academic work.

Examinations

Examinations are classified as (1) final examinations at the end of each quarter, (2) special examinations; and (3) other course examinations as determined by the instructor. The final examination policy is stated below.

Announced tests in undergraduate courses will be administered at a regularly scheduled meeting of the course. Exceptions to this regulation may arise in specialized courses requiring performance or oral tests, and in multiple-sectioned laboratory classes requiring practical laboratory tests. Faculty having sound reasons for scheduling tests at times other than regularly scheduled meeting times are to obtain approval from the department head prior to the beginning of the quarter, and are to present a written schedule of these changes to the class during the first few days of the quarter. Rescheduled tests are not to interfere with other scheduled academic endeavors of the students involved, and an appropriate reduction in regularly scheduled class time is to be given to compensate for the rescheduled test period.

FINAL EXAMINATIONS. A final examination is a desirable means of evaluation in most undergraduate courses. In unusual circumstances, performance tests, term papers, research projects or other forms of evaluation appropriate to the objectives of the course may be substituted for a final examination with the approval of the department head, who will report his action to the dean and Vice President for Academic Affairs. Faculty not giving a final examination are to present to the class at the beginning of the quarter a written description of how final grades will be determined.

Final examinations should be administered during the hours specified in the quarterly examination schedule. Due to the specialized nature of many small upper-level undergraduate courses and graduate courses, deviations from this requirement are sometimes warranted. Such deviations are to be approved by the Vice President for Academic Affairs, and rescheduled examinations must not interfere with scheduled academic activities of the students involved. The professor teaching a 600-level course shall determine whether a formal final examination is appropriate.

Grades

Final passing grades are A, superior; B, good; C, acceptable; D, passing; and S, satisfactory. Final failing grades are F, failure; FA, failure for excessive absences; XF, absent from final examination and failing at the time; U, unsatisfactory; and WF, officially dropped with permission of the student's dean but failing at time of withdrawal.

A NG, no grade, thesis and dissertation research credit, is assigned to courses 699 Research for Thesis and 799 Research for Dissertation.

An X is assigned if the student is passing but missed the final examination, or if he has incomplete work and is absent from the final examination. An IN is assigned if the student has cleared the final examination but has not completed other required work. Grades of X and IN must be cleared during the student's next residence quarter or they will be recorded as permanent failing grades.

The first four days of each quarter are designated as the Special Examination period to remove X grades. The student will get a permit from the dean in order to make up a missed examination. A grade of IN will be changed by the Registrar upon written notice from the instructor. A final grade may be changed only by the written request of the instructor, with the approval of the department head and dean which must be submitted to the Registrar.

A grade of F and additional penalties may be assigned for academic dishonesty. See the Student Academic Honesty Code section in the *Tiger Cub* for further information.

GRADE ASSIGNMENT FOR CLASS WITHDRAWALS. No grade penalty shall be assigned for dropping a course on or before the fifteenth day of the quarter. (For courses with fewer than five meetings per week, 15 class days should not be confused with 15 class meetings.)

A student who withdraws from a course prior to the first 10 days will have no grade assignment; however, after the first 10 days but prior to the first 16 days a W (passing) grade will be recorded for the course.

If a course is dropped after the first 15 days, but by the date of mid-quarter, the instructor shall assign a grade of W (passing) or WF (failing) as the case may be. A course can be dropped with a W after mid-quarter only under unusual conditions. When approval

for dropping the course under such circumstances is granted by the student's dean, a W may be assigned only when the instructor indicates that the student is clearly passing the course. Otherwise, a grade of WF is assigned.

GRADE AVERAGE AND QUALITY POINTS. A 4.00 grade scale is used. An A equals 4.00; B, 3.00; C, 2.00; D, 1.00; and F equals 0.00. Only course work attempted at Auburn University is used in determining the grade report average and continuation-in-residence requirements. S and U grades do not enter into grade-point computations.

S-U GRADING. Grades of S (Satisfactory) and U (Unsatisfactory) may be assigned only to courses approved to be graded S-U, and courses elected under the S-U option.

A junior or senior with a minimum overall grade average of 2.5 on at least 30 hours of credit earned at Auburn may elect any course to be graded on the S-U option, except for courses required in the freshman and sophomore years or for courses constituting the major as defined by the student's curriculum. A total of 20 credits may be earned at the rate of one course per quarter. The student will receive credit toward a degree for these courses, provided credit is normally accepted in his curriculum for this course work.

An unclassified student may schedule one or more courses on the S-U option with the approval of the dean. Course work completed on the S-U choice by unclassified students may not be applied later to degree requirements should the student become a degree candidate.

A graduate student may enroll in undergraduate courses, except for 400-level courses taken for graduate credit, under the S-U option on the major professor's recommendation.

Students are not permitted to change from S-U grading to conventional grading or vice versa after the schedule adjustment period.

GRADE REPORTS. In compliance with the Family Rights & Privacy Act (Buckley Amendment) of PL 93-380 (Educational Amendments of 1974) one copy of each student's grade report is mailed at the end of each quarter to the student at the address furnished by the student.

Dean's List

The name of every eligible student who meets certain scholastic requirements for a given quarter is placed on a list prepared for the dean of the student's School. This honor is also noted in the student's permanent record.

To meet Auburn University's requirements for inclusion on the dean's list, the student must be enrolled for 15 or more credit hours exclusive of any S-U option courses, pass all courses attempted for the quarter, and earn a grade-point average of at least 3.40 (on the 4.00 system). Furthermore, the dean of each School has established specific criteria governing inclusion on the list. The special requirements, applied in addition to the University regulations, are listed as follows:

- School of Agriculture: 3.70 average.
- School of Architecture and Fine Arts: a grade-point average within the upper 10 percent of the full-time students enrolled in a given department.
- School of Arts and Sciences: 3.75 average.
- School of Business: 3.80 average.
- School of Education: 3.80 average.
- School of Engineering: 3.70 average; only if an S-U graded course is required in the student's curriculum may it be included in the 15-hour minimum total.
- School of Forestry: 3.70 average.
- School of Home Economics: 3.80 average.
- School of Nursing: 3.75 average.
- School of Pharmacy: 3.75; only if an S-U graded course is required in the student's curriculum may it be included in the 15-hour minimum total.
- School of Veterinary Medicine: grades in the upper five percent of the enrollment of each class.
- Interdepartmental-Environmental Health: 3.65 average.

Resignation

Students who wish to resign from all course work for a quarter should contact their deans. They withdraw without penalty of failure if they resign no later than mid-quarter, a date specified in the University calendar.

After this date, the dean will obtain from the student's instructors his or her scholastic standing at the time of resignation, and report it to the Registrar. If the student is failing in over half of the work, the number of hours reported as failing will be counted as credit

hours attempted and will be included in academic eligibility calculations. Those hours reported as passing will be dropped and will not be counted in the grade-point computation. Furthermore, when a student's total hours attempted, multiplied by two, exceed grade points earned by more than 45 at the end of the last quarter in residence prior to resignation, the grades will be reviewed by the dean to determine whether the student has a C average for the quarter in which he or she is withdrawing. Students not having C averages will be placed on academic suspension.

When a student through illness or physical disability is forced to resign after mid-quarter, and when this condition has been the main factor in causing scholastic deficiencies, discretionary power in waiving the scholastic penalty will rest with the student's dean. A student who is resigned for disciplinary reasons will retain the academic status achieved immediately prior to the disciplinary action.

Academic Probation and Suspension of Undergraduates

Auburn University may place an undergraduate student on probation or suspension at any time if the student flagrantly neglects academic work or makes unsatisfactory progress toward graduation.

Academic eligibility requirements for continuation in residence are calculated on Auburn University course work. Academic probation is a scholastic warning, indicating that the student is in danger of being suspended. A student on probation can continue enrollment without interruption. Academic suspension is a status that bars a student from continued enrollment at the University for a period of time.

A student will be placed on academic probation whenever the total number of hours attempted at Auburn, multiplied by two, exceed grade points earned by more than 25 except that no entering freshman will be placed on probation on the basis of the first quarter's work at the University.

A student may remove probation status by reducing the grade point deficiency to 25 or fewer grade points.

An individual on academic probation will be placed on suspension when the number of hours attempted at the University, multiplied by two, exceed grade points earned by more than 45. However a student will not be suspended at the end of a quarter in which a 2.0 (C) average was earned, but will be continued on probation.

A student's first academic suspension will be for a period of two quarters, summer quarter being counted as any other quarter. He or she will be readmitted on academic probation following the expiration of the first suspension. A student who incurs a second academic suspension is placed on indefinite suspension for at least four quarters before an application for readmission will be considered.

An academically suspended student who has incomplete or other deferred grades which could, when cleared, remove the suspension will be permitted to register conditionally for the next quarter. The suspension must be removed within two weeks of the beginning of the quarter; otherwise the student will be resigned by the Registrar's Office.

No credit earned at another institution by a student on academic suspension from Auburn will be used in clearing a suspension or in meeting requirements for an Auburn University degree.

A student who resigns after mid-quarter may be subject to academic suspension. (See Resignation on page 26 for further information.)

SCHOOL OF ENGINEERING. Students enrolled in a professional curriculum in the School of Engineering may be placed on Engineering academic suspension if their overall grade averages drop below a 2.0. Specific details are listed in the School of Engineering section of this catalog.

SCHOOL OF PHARMACY. A student enrolled in the School of Pharmacy who is placed on academic suspension and who wishes to re-enter the School must, in addition to complying with other University readmission requirements, be approved for readmission by the Pharmacy Admissions Committee and, when applicable, by the University Admissions Committee.

SCHOOL OF VETERINARY MEDICINE. Any student who earns less than a 2.25 grade-point average for any quarter will be placed on academic probation. A student who fails to earn a 2.25 grade-point average for any two quarters in the same academic or calendar year

may be dropped from the School of Veterinary Medicine for scholastic deficiency. In addition, a student who does not have an overall average of 2.25 for an academic year or who does not have a veterinary overall average of 2.25 for an academic year or who does not have a veterinary school cumulative average of 2.25 at the end of any academic year may be required to withdraw from the School of Veterinary Medicine.

A student who makes a grade of F on any course may be dropped from the School of Veterinary Medicine until such time as the course is offered again. Such student may be required to repeat certain other courses in the curriculum for the quarter in which a grade of F was earned.

Students who are dropped under the above provisions are eligible for admission to other curricula provided they meet the general scholastic requirements for continuance in the University. Scholastic penalties incurred during enrollment in the School of Veterinary Medicine will become part of the student's record.

Satisfactory Progress

STUDENT ATHLETES: In addition to meeting the general academic requirements of the University, student athletes must meet all academic requirements, including those relating to satisfactory progress toward a degree, set forth in the legislation of the Southeastern Conference (SEC) and of the National Collegiate Athletic Association (NCAA).

STUDENT FINANCIAL AID RECIPIENTS: In addition to meeting the general academic requirements of the University, applicants for student financial aid funds must maintain Satisfactory Academic Progress in order to receive, or to continue to receive, assistance through federal, state, and institutional student aid programs. Detailed descriptions of these Satisfactory Academic Progress requirements for distinct classifications of Auburn students are available from the Office of Student Financial Aid.

Advanced Standing and Credit

Entering freshmen with superior preparation may qualify for advanced placement and/or credit not to exceed a total of 45 quarter hours in the following areas: biology, botany, chemistry, English, foreign languages, history, mathematics, physics, and zoology.

Advanced placement or credit may be granted to entering freshmen who during their senior year in high school have made satisfactory scores on the College Board Advanced Placement Examinations. A student with special competence in a specific area, as evidenced by secondary school records and scores on college ability or achievement tests, may qualify for advanced placement or credit by scoring well on a departmental proficiency examination.

The amount of credit allowable through advanced placement is determined by the dean and the department head concerned.

Students transferring to Auburn University who have received advanced standing credits from another institution may be awarded advanced standing credit for examinations, advanced placement and CLEP tests, military service courses or experiences, and proficiency tests insofar as the University's requirements for awarding such credits are met and the credits are applicable to the student's curriculum.

Prospective students are advised to write to the Registrar's Office at Auburn University requesting a brochure on the Advanced Standing Program. This brochure details the advanced placement and credit programs, the College Level Examination Program (CLEP), the General and Subject examinations of the CLEP, and the minimum scores required on the tests.

DEPARTMENTAL PROFICIENCY EXAMINATIONS may be given by a department upon application of students. They may apply for such a test if they have taken college-level work in secondary school, in class or on a tutorial basis, or through private study. If they earn satisfactory grades on the subject examination they will be eligible for placement in an advanced course and for credit in the subject.

MILITARY SERVICE CREDIT. Students who have served in the Armed Forces may receive credit for military courses completed at the college level and correspondence courses completed through the Armed Forces Institute.

Those who have had military service may receive physical education credit as follows: for less than six months service, no credit; for six months to a year, two hours for Physical Education 101; for one year in service, three hours credit.

Application for credit should be submitted to the Registrar. The student's dean must approve credits into the student's curriculum.

Correspondence and Extension Credit

A student may earn a maximum of 25 percent of the total credits required for the baccalaureate degree by correspondence or extension; however only 18 hours of the final year's work may be earned thus. An individual having less than three quarters in residence prior to the last academic year may earn only 15 hours by correspondence or extension.

A student in residence may not enroll in a correspondence course if the course or a suitable substitute can be scheduled. The resident student may not exceed the maximum class hour load by adding a correspondence course. A student must have prior approval of his/her Auburn dean if the credits are to be applied toward an Auburn degree.

The grade earned for correspondence credit will be entered on the student's record.

Information on available courses may be obtained from the Independent Study Office, 100 Mell Hall, Auburn University, Alabama 36849-3501, (205) 826-5100.

Military Science and Physical Education Credit

A student may be allowed 18 credits in military science courses toward graduation. Of these 18 credits a maximum of 6 credits of basic R.O.T.C. at the rate of 1 credit per course is allowed for graduation.

A student may be allowed 6 credits in physical education activity courses toward graduation.

The total number of credits allowed toward graduation for military science and physical education courses varies by academic school and curriculum. Students should determine with their academic deans' offices the amount of credit allowable in their curricula.

Degree Requirements

To earn the bachelor's degree students must complete the subjects in their curriculum and must earn at least a C average on credits accepted for their degree program. An individual with credit from another institution must also have a C average on their Auburn course credits used in their curriculum toward graduation. Students in Business and Engineering curricula must have a C average on all work attempted at Auburn. Students in Engineering must also have a "C" average in their major courses. Credits required for graduation range from 196 to 257 hours.

The student's dean clears subject requirements in the curriculum; the Registrar clears total hour, grade point, and freshman English.

Forty-five hours must be earned in residence in order to receive a bachelor's degree. As a general rule the 45 hours must be taken in the final year and in the school or curriculum of graduation. The student's dean may waive the final year's residence, and may also allow course credit to be earned at another institution during the final year. However the 45 hours in residence at Auburn is a firm requirement.

To complete a second baccalaureate degree, an Auburn graduate must complete an additional 45 hours, at least 90 grade points, 36 weeks in residence, and satisfy course requirements in the curriculum. Graduates of another four-year institution who seek a bachelor's degree at Auburn must complete the hours required in the final year of their curriculum and satisfy the requirements listed immediately above.

Seniors must clear deferred grades by the tenth day of the graduation quarter for courses to be used toward degree requirements. Correspondence courses must be completed by mid-quarter prior to graduation.

A graduation fee is payable to the Cashier's Office, at the beginning of the quarter of graduation. If a student is in default on any payment due the University, the diploma and academic record will not be issued until the matter is cleared.

Degrees are conferred at Commencement exercises each quarter. If a student does not plan to attend the exercises, arrangements should be made with the dean or the Registrar to receive the degree *in absentia*.

Graduation Honors

Students with a minimum overall grade average of 3.4 are graduated *With Honor*; a 3.6 *With High Honor*; and a 3.8 *With Highest Honor*. This distinction of high academic achievement is placed on the student's diploma and on his permanent record.

The grade average for graduation honors must be achieved on Auburn University course work. A student with transfer credits must have the required grade average on all course work attempted elsewhere as well as on Auburn University courses. Grades of S or U and noncredit courses are not used in the calculations.

Students earning a second baccalaureate degree must earn the minimum overall grade average required for honor distinction on the additional hours completed for the second degree as well as on all course work attempted.

At least 45 hours and three quarters in residence at Auburn University are required for graduation honors.

Student Academic Grievance Policy

The Student Academic Grievance policy, which appears in full in the student handbook, *Tiger Cub*, is designed to resolve academic grievances of students which result from actions of faculty or administrators.

Confidentiality of Student Records

The University recognizes that the maintenance of student information and educational records is necessary and vital to assist the student's education and development and to provide opportunities for University research and policy formulation. The University recognizes its obligation to exercise discretion in recording and disseminating information about students to insure that their rights of privacy are maintained.

The University will furnish annual notification to students of their right to inspect and review their educational records; the right to request amendment of educational records considered by them to be inaccurate or misleading or that violate privacy or other rights; and of their right to a hearing should the University decline to amend such records. This annual notice will be published in the University's Bulletin.

The following guidelines have been developed to insure the privacy rights of students. For the purposes of this policy statement a student is defined as an individual who has been admitted and has been in attendance in a component unit of the University. Classification as a student in one component unit of the University (e.g., an undergraduate program) does not infer that the person has been accorded the rights outlined below in other component units (i.e., graduate school, professional schools, branch campus).

Student Access to Records

Students have the right to be provided a list of the type of educational records maintained by the University which are directly related to the student; the right to inspect and review the contents of these records; the right to obtain copies of these records; the right to a response from the University to reasonable requests for explanation and interpretation of these records; the right to an opportunity for a hearing to challenge the content of these records; and if any material or document in the educational record of a student includes information on more than one student, the right to inspect and review only the part of such material or document as relates to the student.

Students do not have access to: financial records of their parents; confidential letters and statements of recommendation which were placed in the educational record prior to January 1, 1975, provided such letters or statements were solicited or designated as confidential and are not used for purposes other than those for which they were specifically intended; confidential recommendations, if the student signed a waiver of the right of access, respecting admission, application for employment, and the receipt of an honor or honorary recognition.

Students do not have access to: instructional, supervisory, and administrative personnel records which are not accessible or revealed to any other individual except a substitute; Campus Security records which are maintained apart from educational records,

which are used solely for law enforcement purposes, and which are not disclosed to individuals other than law enforcement officials of the same jurisdiction; employment records except when such employment requires that the person be a student; and the Alumni Office records.

Students do not have access to physical or mental health records created by a physician, psychiatrist, psychologist or other recognized professional acting in his or her capacity or to records created in connection with the treatment of the student under these conditions which are not disclosed to anyone other than individuals providing treatment. These records may be reviewed by a physician or appropriate professional of the student's choice.

Procedures for Access

The Registrar's Office has a complete list of educational records maintained by the University which students may obtain. Students should contact the appropriate office to inspect and review their records. An office may require that a University official be present when a student inspects and reviews his educational records. Any questions concerning a student's access to records should be directed to the Registrar.

Release of Directory Information

"Directory Information" may be released by the University without the student's written consent. Directory information consists of all items listed on the student's registration card, participation in recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, the most recent previous educational agency or institution attended, and other similar information.

A student may deny the release of directory information by requesting that the information not be released. This should be done at registration time. The student who is in attendance must notify the Registrar's Office in writing each quarter of enrollment to deny the release of this information. To deny the release of participation in recognized activities the student must notify the Dean of Students and his Academic Dean in writing. To deny the release of athletic information the student must notify the Director of Athletics in writing. To deny the release of directory information a student must give the above notification each quarter of registration. A former student, one who is not in attendance, must contact the appropriate offices above to deny the release of directory information.

Release of Educational Records

The University will release a student's educational record(s) upon the student's written request. The student must:

1. Specify the records to be disclosed.
2. Include the purpose or purposes of the disclosure.
3. State the party or parties and the address to whom the information is to be disclosed.

The student shall, upon request, receive a copy of the record that is to be disclosed. It is University policy to furnish single copies of a student's record at no charge except for the standard transcript fee, if applicable.

The University may release students' educational records to the following without prior written consent:

1. University officials who have a legitimate educational interest in the records. University officials are defined as teachers, administrative personnel and other employees except personnel of the security or law enforcement unit of Auburn University who in the performance of their normal duties require access to student records. If University officials are required in the performance of their duties to review the educational records of a student, this will be considered to be a legitimate educational interest.
2. Officials of another school in which the student intends to enroll upon request of the transfer school.
3. Government representatives of the Comptroller General of the United States, the Secretary of Education, the U.S. Commissioner of Education, the Director of the National Institute of Education, the Assistant Secretary for Education, State educational authorities, and State officials to whom such information is specifically required to be reported or disclosed by State law adopted prior to November 19, 1974.
4. Appropriate authorities in connection with financial aid with the understanding that only the necessary records will be released.
5. To organizations conducting studies for, or on behalf of, the University or its agencies for the purpose of developing, validating, or administering predictive tests, administering student aid programs, and improving instruction and student life provided that the studies will not permit the personal identification of students and their parents by individuals other than representatives of the organization and provided that the personally identifiable information furnished will be destroyed when no longer needed for the purposes for which the study was conducted.

6. To accrediting organizations to carry out their accrediting functions.
7. To parents of a dependent student as defined in section 152 of the Internal Revenue Code of 1954, University officials may release educational records to parents on the basis of a written certification from the parent that the student is a dependent as defined under the Code.
8. To comply with a judicial order or lawfully issued subpoena with the understanding that the student will be notified in advance insofar as possible.
9. To appropriate parties to protect the health and safety of the student or other individuals in emergencies with the understanding that only information essential to the emergency situation will be released, that information will only be released to a party who would be in a position to deal with the emergency, and that the student will be notified insofar as possible of the information released, the purpose for the release, and to whom the information was released.

No personal information on a student will be released without a statement from the University to the party receiving the information that no third party is to have access to such information without the written consent of the student.

Each office with educational records will maintain a record of each request and disclosure of personally identifiable information from the educational records of a student except for information requested in writing by the student, information released to the student or the student's parents, directory information, and information released to University officials and teachers who have a legitimate educational interest in the records. The student may inspect the record of requests, disclosures and the legitimate interests of parties requesting or obtaining information in the appropriate University office.

Amending Educational Records

Students may request that any information contained in their educational records which they consider to be inaccurate, misleading, or in violation of their privacy or other rights be amended or deleted from the records. (A grade or other academic scores may not be amended, except that the accuracy of recording the information may be challenged.)

Students who request that information in their records be amended should first direct their request to the official with primary responsibility for the information on the record. If the matter is not resolved to their satisfaction, students should direct their requests to the official's dean or division head. If the matter is not resolved to their satisfaction, they may request a formal hearing.

Right to a Formal Hearing and Procedures for Decision

Students may request formal hearings to challenge information contained in their educational records. The hearing will be held in a reasonable time (not to exceed 45 days) and in a reasonable place. Students may be assisted or represented by persons of their choice, including an attorney, at the expense of the student, and shall be afforded a full and fair opportunity to present evidence relevant to the issue(s).

Students or their representative should request the hearing in writing and should specifically identify the information they seek to have amended. The request should be directed to the Dean of Students.

The Dean of Students will conduct the hearing and render a decision within a reasonable period of time after the conclusion of the hearing and the decision shall be based solely upon the evidence presented at the hearing. The student shall be notified in writing of the reason(s) for the decision and a summary of the evidence.

If the decision is that the information in the student's educational records is inaccurate, misleading or in violation of his rights and privacy, the statement(s) will be corrected or expunged from the student's records.

If the decision is that the information is not inaccurate, misleading, or in violation of the privacy or other rights of the student and that the information or parts thereof is to remain in the student's educational records, the student shall be notified and given the right to enter a statement in the records setting forth any reason for disagreeing with the decision of the Dean of Students. This statement shall be maintained in the records as long as the record or contested portion thereof is maintained, and if the contested educational record or contested portion thereof is disclosed by Auburn University to any party, the student's explanation shall also be disclosed to that party.

The Secretary of Education has established a review board to receive complaints regarding violation of students' rights. Students wishing to file a complaint directly to the review board should write to the Family Educational Rights and Privacy Act Office,

Department of Education, 330 Independence Avenue, SW, Washington, D.C. 20201. Detailed procedures for this complaint procedure are listed under section 99.63 of the regulations issued by the Secretary and will be furnished upon request by the Registrar, Auburn University.

This policy is adopted pursuant to the Family Educational Rights and Privacy Act of 1974, as amended (20U.S.C. § 1232g), and is not intended to impose any restrictions or grant any rights not specifically required by this Act.

Housing

Auburn University offers a variety of on-campus housing accommodations for students. There are 24 residence halls and 138 apartments to house single students. There are 384 apartments to house married, graduate and upperclass students. All are convenient to classrooms, cafeterias, laundries, mail rooms and recreational areas.

Residence Halls and Single Student Apartments

Apartments for single students are located in Caroline Draughon Village Extension, at the intersection of Wire Road and Roosevelt Drive. The residence halls, with the exception of Alumni Hall which is located on S. College Street, are clustered in three areas on the campus.

The Magnolia Complex consists of:

Magnolia Hall
Noble Hall

The Quadrangle Complex consists of:

I	Elizabeth Harper Hall	VII	Mary Lane Hall
II	Kate Conway Broun Hall	VIII	Ella Lupton Hall
III	Willie Little Hall	IX	Helen Keller Hall
IV	Kate Teague Hall	X	Marie Bankhead Owen Hall
V	Letitia Dowdell Hall	XII	Dana King Gatchell Hall
VI	Allie Glenn Hall		Alumni Hall

The Hill Complex consists of:

A	Mollie Hollifield Hall	F	Dixie Graves Hall
B	Annie Smith Duncan Hall	G	Camille Early Dowell Hall
C	Marguerite Toomer Hall	H	Stella Knapp Hall
D	Zoe Dobbs Hall	J	Mary Boyd Hall
E	Berta Dunn Hall	K	Sara Sasnett Hall

Single student housing includes the following types of living accommodations:

TYPE I

Two bedroom (four students) apartments furnished; air-conditioned; TV cable, carpeted; rent, \$400 per student per quarter. (Caroline Draughon Village Extension, Buildings A-F).

TYPE II

Suites consisting of two double rooms with connecting bath; air-conditioned; rent, \$360 per student per quarter. (Hill dorms A-K, Quad dorms 1,2,3,4,7 & 8).

TYPE III

Suites consisting of two double rooms with connecting

bath; non-air-conditioned; rent, \$315 per student per quarter. (Quad dorms 5,6,9 & 10).

TYPE IV

Double rooms with community baths on each floor; air-conditioned; rent, \$280 per student per quarter. (Magnolia & Noble Halls). Some Mag. Hall private rooms available, \$420.

TYPE V

Double rooms with community baths on each floor; non-air-conditioned; rent, \$215 per student per quarter. (Quad dorm 12, and Alumni Hall.)

Students contract directly with the telephone company for telephone service in their living quarters.

The prices listed above are subject to change. Any rate increase will be announced prior to the cancellation date for the quarter the Agreement is to begin.

Specially equipped facilities for handicapped students are provided in four campus residence halls and fourteen apartments. These facilities include wheelchair ramps, special designed bathrooms, and modified furnishings.

Each residence hall is staffed with a Hall Director who serves as a counselor to the students. Students' rooms are furnished with single beds, study desks, mirrors, chest of drawers, chairs, book shelves, and closets. Residents may bring other furnishings in-

cluding study lamps, bedspreads and linens, curtains or drapes, rugs or carpet, extra book shelves, radios, stereos, television sets, plants, posters, and small refrigerators. Students are encouraged to bring room fans for non-air-conditioned halls, but room air-conditioners are not allowed. Most residence halls have kitchens for use by the occupants and lounges for entertaining or watching television.

The apartment complex for single students (Caroline Draughton Village Extension) is within walking distance of all classroom buildings and recreation and sports facilities. These two-bedroom apartments accommodate four students. Each apartment has an all-electric kitchen and features modern furnishings, carpeting, and venetian blinds. Beds are extra-long twin size. Students should bring their own linens, dishes, utensils, and other items to personalize their apartments. TV cable is included in the rent. Parking areas are adjacent to the apartments. Laundry facilities, a delicatessen, snack area, and a study lounge are in the complex.

Married, Graduate and Upperclass Students

Apartments for married students are located in Caroline Draughton Village. Single graduate and upperclass students reside in the Village on a limited basis. These apartments are grouped in two-story brick buildings of 8, 16, and 20 units. Each apartment has a separate outside entrance. The apartments feature all-electric kitchens, furnished living and dining rooms and bedrooms, spacious closets, ample cabinets and baths with shower-tub combinations. A limited number of unfurnished apartments is available. Monthly rent includes heat, water, solid waste disposal, sewage, garbage pickup and TV cable. Electricity and telephone charges are the responsibility of the resident.

There are 224 two-bedroom and 160 one-bedroom apartments in Caroline Draughton Village. These units include the following types of living accommodations.

TYPE A

Two bedroom apartments; central air-conditioned; rent per month: \$255 furnished, \$250 unfurnished.

TYPE B

Two bedroom apartments; 18,000 BTU air-conditioner in master bedroom; rent per month: \$220 furnished, \$215 unfurnished.

TYPE D

One bedroom apartments; 18,000 BTU air-conditioner in master bedroom; rent per month: \$200 furnished, \$195 unfurnished.

TYPE E

One bedroom apartments; non-air-conditioned; rent per month: \$190 furnished, \$185 unfurnished.

TYPE C

Two bedroom apartments; non-air-conditioned; rent per month: \$210 furnished, \$205 unfurnished.

The prices listed above are subject to change. Any rate increase will be announced prior to the cancellation date for the quarter the lease is to begin.

Married students and/or single graduate students pay monthly rates. Single undergraduate students in Caroline Draughton Village pay quarterly rent. This rent may vary by the number of students occupying each apartment. Each single undergraduate student contracts individually for his or her space.

A Reservation in University Housing is not Valid Unless the Applicant has been Admitted to Auburn University.

Admission to Auburn University does not automatically include a space in University housing. It is the responsibility of the student to make housing arrangements either on or off campus. Housing information is sent to entering students with their provisional acceptance to the University.

Students may apply for any number of quarters within the Summer-Fall-Winter-Spring contract period by submitting a Housing Application with a \$15.00 (non-refundable) processing fee. Priority for housing is based upon the date the application, with processing fee, is received and the number of quarters applied for. Students entering University housing summer quarter have priority over those entering University housing fall quarter.

The Housing Agreement, when offered, will be for a space (apartment, if married) in University Housing. In order to make a reservation in University Housing, the Housing Agreement must be returned to the Housing Office promptly with a \$100.00 check for the housing deposit.

Deposits may be made by check payable to Auburn University and must be received at the Housing Office, Burton Hall, Auburn University, Alabama. The deposit is a combination room reservation/damage/room clearance deposit and is not applicable to rental payment, except on cancellation as provided within the Housing Agreement. The Housing Agreement outlines conditions under which refunds will be made.

University Housing, with the exception of Caroline Draughton Village (older section), officially *opens* for occupancy on the day preceding registration and schedule adjustment and *closes* and must be vacated by the day following graduation for each quarter. Residence halls do not remain open for the Thanksgiving break.

Rent for spaces/apartments in Caroline Draughton Village (older section) includes holidays and between quarter breaks. Occupancy in the Caroline Draughton Village (older section) may begin prior to academic quarters as apartments are vacated.

Occupancy prior to the official opening of University Housing requires prorated rental payments.

Quarterly rental payment (monthly for married and graduate students in Caroline Draughton Village) is due and must be received in the Housing Cashier's office on the applicable payment due date. If the student is not a resident of University Housing at the time his or her Agreement is signed, the student's rental payment must be received by the payment due date specified on the room/apartment assignment letter. If the student is a resident of University Housing at the time his or her Agreement is signed, the student's rental payment must be received on the applicable payment due date for the quarter the Agreement is to begin as follows: Summer — June 1; Fall — July 1; Winter — December 2; Spring — March 8.

The quarterly payment due dates above also apply to subsequent quarters in residence except for students in residence summer quarter whose payment due date for the fall quarter is August 1. The payment due date for married and graduate students in Caroline Draughton Village is the first day of each month. When full rental payment is not received by the applicable payment due date, the University may cancel the Agreement or accept late payment, assessing the student a late payment fee of \$10.00 for each seven day period between the due date and receipt of full payment. Refer to the Housing Agreement for other collection remedies.

Off-Campus Housing

Privately-owned dormitories, fraternities, apartments, houses, and mobile homes in the Auburn community also provide living quarters.

The University neither inspects nor approves off-campus housing. The facilities must, however, conform to federal regulations and to the local code of health and safety regulations.

A listing of off-campus housing facilities may be obtained by writing the Housing Office, Burton Hall, Auburn University, AL 36849-3501, or by visiting any of the following offices: Housing, Admissions, Foy Union Desk and Cater Hall.

Food Services

Auburn University Food Services is a non-profit organization supported entirely by food sales in the various Food Services operations located on campus. The individual operations, varying in size and composition, offer a wide variety of services to meet the needs of students, as well as faculty, staff, and visitors to the Auburn campus. All services offered to students are strictly on a voluntary basis and are available to students living both on and off campus. A brief synopsis of each unit's location and services follows:

War Eagle Cafeteria, located in the Foy Student Union, offers complete cafeteria services and a full line snack bar. War Eagle also houses the University Faculty Club and is responsible for all University Catering.

Magnolia's Deli 'N' More, located in the Magnolia Dormitory Complex, maintains a grocery outlet, full line snack bar, meats and cheeses by the pound, and a bakery outlet. Magnolia is open late night.

Terrell Cafeteria, located in "the hill" dormitory complex, offers full cafeteria services, a bakery outlet, and a snack bar that remains open late night.

The Kitchen Deli, located in the Caroline Draughton apartment village, contains a grocery outlet, a bakery outlet, meats and cheeses by the pound, and a take out only snack bar, that remains open late night.

The Li'l Eagle, located on the west side of Terrell Cafeteria, provides convenience items for the Hill dorm residents, including baked goods, and grocery items.

Quad Center, located in the Quad Center complex, is undergoing complete renovation. When re-opened, the facility will provide complete dining services to Quad residents.

Sewell Cafeteria, located in the athletic dorm, is operated by Food Services for scholarship athletes.

"The Bakery," located in Terrell Cafeteria, offers a wide range of freshly baked breads, cookies, cakes, desserts, and pastries shipped daily to our operations. Cakes for special occasions are baked "to order."

Meal Plan — The Chef's Club — Students have the opportunity to become members of the Chef's Club, Food Services meal plan. As members of the Chef's Club, students may choose between a pre-payment plan or a charge plan. The pre-payment plan or "declining balance plan" allows the student to pay in advance, and budget that amount through the quarter. The charge plan offers students the convenience of charging their meals in any of the food service operations located on campus. A membership fee of \$6.00 per quarter will be paid as follows:

Members joining summer quarter — \$24 fee — card valid through spring quarter

Members joining fall quarter — \$18 fee — card valid through spring quarter

Members joining winter quarter — \$12 fee — card valid through spring quarter

Members joining spring quarter — \$6 fee — card valid through that quarter only

If a student graduates or leaves school, the membership fee will be reimbursed for each complete unused quarter.

Students may receive credit approval by furnishing a parent's notarized signature as co-signer or by furnishing two credit references. Chef's Club charges are billed on a monthly basis and the total amount must be paid within ten days after the mailing. All Chef's Club bills must be paid before a student can register for the next quarter.

Many students who join the Chef's Club have a charge account for the first time. Chef's Club card holders need to be aware that charges can accumulate rapidly and all charges have to be paid. However, students soon learn that, with common sense and discretion, having a Chef's Club card can be both a fun and educational experience.

Additional information about the Chef's Club may be obtained from The Chef's Club, Magnolia Complex, Auburn University, Alabama 36849-3501, 826-5735.

Cash is accepted at all food operations located on campus. However, an advantage of a Chef's Club card or meal plan is that the student does not have to worry about carrying cash at all times during the quarter.

Student Health Center

The Health Center is concerned with the mental, physical, and emotional health of students while attending Auburn and consists of out-patient services and limited in-patient day care. The out-patient clinic, equipped with modern x-ray and laboratory facilities, is staffed with physicians, psychologists, and nurses who provide primary care to the students. Preventive and educational programs are utilized to help students function at their optimal level and to help prepare them for life after school.

Services are made available through mandatory health fees which are paid with tuition. Most services are covered, however, fee for service charges may be made on tests and supplies to defray the cost. Services are available to currently enrolled students only.

Hours of Operation:

Fall, Winter and Spring Quarters — Open Monday-Friday 8:00 a.m. - 8:00 p.m.
Saturday 9:00 a.m. - 12:00 noon
Summer Quarter — Open Monday-Friday 8:00 a.m. - 4:30 p.m.

Closed on University Holidays. The Health Center closes at 4:30 p.m. on the day preceding a University holiday until 8 a.m. on the day following the holiday.

Between Quarters service is available on Monday-Friday to students registered for the next quarter 8 a.m.-4:30 p.m.

Student Insurance: The Student Government Association sponsors an Accident and Sickness Insurance plan which is available to all registered undergraduate and graduate students, spouses and dependents. The plan provides maximum coverage at minimum cost. Additional information on insurance is available at the Student Health Center. The SGA sponsored health insurance or equivalent is required for all students.

Financial Aid

The Office of Student Financial Aid at Auburn University provides financial assistance to students who need aid in order to attend the University. The University believes that the amount of aid granted should be based on financial need. To determine need, Auburn uses the ACT Need Analysis System of the American College Testing Program. Students seeking assistance are required to submit the Family Financial Statement to the ACT Program annually. Applications for aid should be completed in January or February of the year prior to the academic year in which the student will need assistance. Application materials and a brochure describing available aid programs may be obtained from the Office of Student Financial Aid, 203 Mary Martin Hall.

The financial aid for which students may apply includes scholarships, grants, loans and part-time employment.

Scholarships may be awarded to undergraduates who have shown high academic attainment and promise. Some scholarship programs also require a demonstration of financial need. *Pell Grants* and *Alabama Student Assistance Program Grants* are provided to undergraduate students who can demonstrate need. *Supplemental Educational Opportunity Grants* are available, in limited number, to undergraduates with financial need.

National Direct Student Loans and *Institutional Loans* provide long-term, low interest loans to students who can demonstrate need. Long-term *Guaranteed Student Loans* may be obtained from commercial lending institutions.

The College Work-Study Program provides part-time employment for students who demonstrate financial need. The *Health Professions Loan Program* makes available long-term loans for students in Pharmacy and Veterinary Medicine.

Graduate students may be eligible for teaching and research assistantships and traineeships. Information is available from the head of the department of the student's major field.

Employment

Students seeking part-time employment while attending the University should contact the Student Employment Service. As a referral agency, the service assists students in finding employment on campus as well as maintaining bulletin boards with notices of job openings with businesses and industries in the local area. Applicants for employment are referred to prospective employers on the basis of the date of application and the skills of the applicant.

Auburn University employs in excess of 1,800 students on an hourly basis. Students may work a maximum of 30 hours per week while enrolled for six or more quarter hours. The number of hours set by off-campus employers may vary but usually range from 10 to 30 hours per week.

Applications and additional information may be obtained from the Student Employment Service, 203 Mary Martin Hall.

Career Development Services

Counseling Services provides confidential assistance to students who need help with curriculum selection, career exploration, personal concerns, and legal matters.

Testing Services, in addition to offering a wide variety of inventories and tests to aid in the counseling process, serves as a center for many national testing programs such as ACT, SAT, GRE, CLEP and GED. The Study-Partners and Skills counselors assist students with academic problems.

Placement Services assists students and alumni in securing business and professional positions through contacts with potential employers. Representatives of firms and agencies visit the campus each quarter for personal interviews with students. Seniors and graduate students who desire information and assistance should visit Placement.

Special Program Services provides workshops and programs for international, minority, handicapped, commuting and nontraditional students.

Student Government Association

Upon enrollment at Auburn University, each student becomes a member of the Student Government Association, the official organization of the student body. The SGA is the voice of the students, promoting cooperation and communication with the faculty, administration, the Auburn City Council, and the state legislature. The SGA also promotes the social and academic life of Auburn students.

The SGA is organized into three branches. Headed by the SGA President, the executive branch takes on many special projects through the Executive Cabinet. The legislative branch, the SGA Senate, is made up of representatives of each school and housing district. The judiciary branch makes final judgment on all decisions involving the Code of Laws. The Student Government Constitution and Laws, published in the *Tiger Cub*, detail the functioning of the student government.

Student Communications — The following media, supported by Student Activity fees, are subject to supervision by the Board of Student Communications:

- The Auburn Circle*, a general interest magazine
- The Glomerata*, the yearbook issued each spring
- The Auburn Plainsman*, the weekly student newspaper
- The Tiger Cub*, annual student handbook
- WEGL-FM, the student operated campus radio station

Other publications include the *Auburn Design*, published yearly for and by students in Industrial Design; the *Auburn Veterinarian*, a quarterly published by and for students in Veterinary Medicine; and the *Auburn Pharmacist*, issued once a quarter by the School of Pharmacy. The latter three do not derive support from the Student Activity fee.

The Foy Union — The Foy Union serves as a focal point for co-curricular student activities as well as other campus programs. The Union houses the *Plainsman*, *Glomerata*, *Auburn Circle*, Alpha Phi Omega Bookstore, SGA, IFC, Panhellenic Council, University Program Council, Alumni Association, War Eagle Cafeteria, a recreation room, a typing room, wood-working hobby shop, and an art gallery. It also provides lockers for commuters, a 24-hour banking service, several lounge areas and an assortment of meeting and banquet rooms. In addition, a University-wide information center and calendar of events are maintained.

The University Program Council — The University Program Council serves as a clearing house for campus programs as well as providing a wide range of programs and entertainment through the following committees: Fine Arts, Major Entertainment, Horizons, Publicity, Special Events, Outdoor Recreation, Indoor Recreation, Films, Religious Affairs, and Public Relations. The experience students acquire in planning and executing these programs offers them the opportunity to enhance their personal growth and development.

The University Chapel — The University Chapel, located on the corner of South College Street and Thach Avenue, is open on weekdays for students, faculty, and staff. It is used for prayer and meditation and can be reserved for religious and certain other University events at nominal or no cost with the Assistant Union Director. The use of the organ is supervised by the Department of Music.

Organizations

The student handbook, *Tiger Cub*, available in the office of the Dean of Students, has a complete listing of the more than 300 chartered and officially recognized organizations on the Auburn campus. Most of these organizations are open to any interested student.

Among the national organizations on campus there are honor societies, national recognition societies, social sororities and social fraternities. They are:

National Honor Societies

The following members of the Association of College Honor Societies have established chapters at Auburn:

Alpha Epsilon (Agricultural Engineering)	Phi Alpha Theta (History)
Alpha Epsilon Delta (Pre-Medicine)	Phi Eta Sigma (Freshman Scholarship)
Alpha Kappa Delta (Sociology)	Phi Kappa Phi (Senior Scholarship)
Alpha Lambda Delta (Freshman Scholarship)	Pi Delta Phi (French)
Alpha Phi Sigma (Criminal Justice)	Pi Sigma Alpha (Political Science)
Alpha Pi Mu (Industrial Engineering)	Pi Tau Sigma (Mechanical Engineering)
Alpha Sigma Mu (Metallurgical & Materials Engineering)	Psi Chi (Psychology)
Chi Epsilon (Civil Engineering)	Rho Chi (Pharmacy)
Delta Sigma Rho-Tau Kappa Alpha (Forensics)	Sigma Delta Pi (Spanish)
Eta Kappa Nu (Electrical Engineering)	Sigma Gamma Tau (Aerospace Engineering)
Kappa Delta Pi (Education)	Sigma Pi Sigma (Physics)
Lambda Sigma (Sophomore Leadership)	Sigma Tau Delta (English)
Mortar Board (Student Leadership)	Tau Beta Pi (Engineering)
Omega Chi Epsilon (Chemical Engineering)	Tau Sigma Delta (Architecture & Allied Arts)
Omicron Delta Kappa (Student Leadership)	Xi Sigma Pi (Forestry)
Omicron Nu (Home Economics)	

National Recognition Societies

The following national societies have chapters established at Auburn:

Alpha Epsilon Rho (Broadcasting)	Omicron Delta Epsilon (Economics)
Alpha Eta Rho (Aviation)	Omicron Kappa Pi (Architecture)
Alpha Phi Omega (Service)	Order of Omega (Greek Leadership)
Alpha Phi Sigma (Criminal Justice)	Pershing Rifles (Military)
Alpha Tau Alpha (Agricultural Education)	Phi Chi Theta (Business Administration and Economics)
Alpha Zeta (Agriculture)	Phi Delta Kappa (Education)
Angel Flight (Air Force ROTC Auxiliary)	Phi Delta Chi (Pharmacy)
Arnold Air Society (Air Force ROTC)	Phi Lambda Sigma (Pharmacy)
Beta Alpha Psi (Accounting)	Phi Lambda Upsilon (Chemistry)
Beta Gamma Sigma (Business)	Phi Mu Alpha (Music)
Block and Bridle (Animal Husbandry)	Phi Psi (Textiles)
Capers (Army ROTC Auxiliary)	Phi Zeta (Veterinary Medicine)
Delta Omicron (Music)	Pi Alpha Xi (Floriculture)
Delta Sigma Pi (Commerce and Business Administration)	Pi Lambda Theta (Education)
Disc and Diamonds (Army ROTC)	Pi Mu Epsilon (Mathematics)
Gamma Sigma Delta (Agriculture)	Scabbard and Blade (Military)
Gamma Sigma Sigma (Service)	Semper Fidelis (Marine Corps ROTC)
Kappa Epsilon (Pharmacy)	Sigma Delta Chi (Journalism)
Kappa Psi (Pharmacy)	Sigma Gamma Epsilon (Earth Sciences)
Lambda Tau (Medical Technology)	Sigma Lambda Chi (Building Construction)
National Student Speech, Language, Hearing Association (Communication Disorders)	Sigma Xi (scientific research)
	Steering (Navy ROTC)
	Upsilon Phi Epsilon (computer science)

Sororities

Alpha Chi Omega	Delta Sigma Theta
Alpha Delta Pi	Delta Zeta
Alpha Gamma Delta	Kappa Alpha Theta
Alpha Kappa Alpha	Kappa Delta
Alpha Omicron Pi	Kappa Kappa Gamma
Alpha Xi Delta	Phi Mu
Chi Omega	Pi Beta Phi
Delta Delta Delta	Zeta Tau Alpha
Delta Gamma	

The Panhellenic Council coordinates the activities of its member groups.

Social Fraternities

Alpha Gamma Rho	Kappa Alpha Order	Pi Kappa Alpha
Alpha Phi Alpha	Kappa Alpha Psi	Pi Kappa Phi
Alpha Psi (professional)	Kappa Sigma	Sigma Alpha Epsilon
Alpha Tau Omega	Lambda Chi Alpha	Sigma Chi
Beta Theta Pi	Omega Psi Phi	Sigma Nu
Chi Phi	Omega Tau Sigma (professional)	Sigma Phi Epsilon
Delta Chi	Phi Delta Theta	Sigma Pi
Delta Sigma Phi	Phi Gamma Delta	Tau Kappa Epsilon
Delta Tau Delta	Phi Kappa Psi	Theta Chi
FarmHouse	Pi Kappa Tau	Theta Xi

The Interfraternity Council coordinates the relationships among the member fraternities.

Intramural Sports and Recreational Services — The University offers a well rounded program of intramural athletics and provides a variety of facilities for recreation. Healthful sports, good sportsmanship, and friendly competition are stressed, and all students are urged to participate in recreational activities.

Regular tournaments are offered in seasonal team and individual sports. The intramural program operates services in the Student Activities Center where students may check out recreation equipment. For additional information, consult the Recreational and Intramural Sports handbook which can be obtained at the Intramural Office, located on the second floor of the Student Activities Center.

Discipline — Auburn University establishes and enforces only those rules and regulations for conduct as are needed to maintain the well-being of the individual student and the University community. The student, in registering at the University, agrees to conform with its regulations. The student is subject to disciplinary action for violating any section of the Code of Student Discipline, which appears in full in the student handbook, *Tiger Cub*. Enrollment in no way exempts any student from penalty in case of conviction by public authorities for commission of an illegal act.

Music, Theatre, and Lectures — Classical concerts, touring play productions, lectures by political figures, news commentators, specialists and prominent scholars, traveling and local shows at the art galleries, opera, ballet, and films are among the special events of the year at the University. Many of these activities are free.

The University Concert Choir, the Choral Union, University Singers, the Marching and Concert Bands, the University Orchestra and the Opera Workshop offer opportunities for those who want to perform in Musical groups.

Eight or nine productions each year are offered by the Auburn University Theatre. Students are welcome to audition for any production but priority in casting is given to theatre majors and minors.

The Auburn Dance Theatre gives students an opportunity to further their dance study and to perform in Winter and Spring concerts as well as in the academic and local communities. Choreography generally includes ballet, jazz, and modern dance styles. The Dance Theatre meets the first Tuesday of classes at 7 p.m. in 1993 Memorial Coliseum.

The Auburn Studio of the Alabama Public Television Network produces programs which are seen throughout the state on the Alabama Educational Television network. WEGL-FM is the campus radio station, operated by students.

Related Programs and Activities

Cooperative Education Program

The Cooperative Education program provides opportunities for students to alternate quarters of academic study with quarters of experience in industry, education, business, and government agencies.

Coordination of study and work combines theory and practice. As a consequence students find increased meaning in and motivation for their studies. This experience helps to develop a sense of responsibility, judgment, and maturity. Students also benefit financially, since they are paid for their work.

In all four-year undergraduate curricula, the Cooperative Education Program is a five-year plan. A student must complete at least two quarters of the freshman year with an above average scholastic record before "being placed" with an employer. Cooperative Education is offered in all curricula of the Schools of Agriculture, Architecture and Fine Arts, Arts and Sciences, Business, Education, Engineering, and Home Economics.

A graduate Co-op Program is arranged for certain students in the master's and doctoral programs where employers can provide professional experiences which relate directly to the student's specialized field of study.

Additional information may be secured from the Director, Cooperative Education, Auburn University, Alabama, 36849-3501.

Independent Study

The Independent Study program provides undergraduate and non-credit correspondence instruction for persons unable to attend college on a regular basis. Courses are also open to enrolled students with their dean's permission. The credit courses parallel those given in the University, award college credit, and are taught by faculty members. Any person is eligible for enrollment, although enrollment is not equivalent to admission to the University.

Upon registration the student receives a course manual and instructions. The student will be required to do textbook reading, submit written assignments, and do possible supplemental work. A supervised final examination is given upon completion of all course assignments.

Although graduate credit cannot be earned by correspondence, certain undergraduate deficiencies may be cleared.

Persons typically enroll in a correspondence course (1) when job or family responsibilities prevent on-campus study; (2) when classroom schedules conflict or a course is unavailable during the quarter it is needed; (3) when a person has been away from formal study for some time and wishes to get back in stride; (4) while at home during the summer break or when participating in a cooperative education program away from the campus.

Courses are available from the following fields: Biology, Economics, English, Geography, Health, Mathematics, Physical Education and Recreation, History, Nutrition and Foods, Political Science, Psychology, Rural Sociology, Sociology, Vocational and Adult Education.

Fees for correspondence courses are listed under Fees and Charges. See also Off-Campus Credit in the section on Academic Regulations. Application forms and a course bulletin are available from Independent Study, Office of Continuing Education, 100 Mell Hall, Auburn University, Alabama 36849-3501, (205) 826-5100.

Special Clinics

The Speech and Hearing Clinic of the Department of Communication Disorders, primarily a teaching facility, provides service for students with speech, hearing or language problems. These services may involve both diagnoses and treatment of problems.

Bookstores

The University Bookstore, located in Haley Center, offers a full line of textbooks and other instructional materials. Alpha Phi Omega service fraternity sponsors a nonprofit bookstore in the Foy Union Building where students may purchase and sell textbooks. There are also commercial book outlets in the city of Auburn.

Vehicle Registration

Registration of vehicles, including bicycles, is a part of the enrollment procedure for all students at the beginning of Fall Quarter.

Students who bring unregistered vehicles, including bicycles, to campus after the Fall enrollment period must register them at once at the University Police department. Failure to register a vehicle, to use the proper decal, and to park in the proper zone will subject the operator to certain penalties.

Freshmen may bring autos to Auburn, but must park them only in areas designated for Freshmen parking. These vehicles may not travel through, or park on, the main part of campus (as defined by Magnolia Ave., College St., Samford Ave., and Donahue Dr.) from 7 a.m. until 5 p.m., Monday through Friday. Vehicles belonging to freshmen are not allowed to park in Residential ("R" zone) areas during the zone enforcement hours. Because of the parking situation on campus and in Auburn, students are not encouraged to bring automobiles unless absolutely required for commuting.

The regulations stated above are subject to modification by the beginning of the Fall Quarter. Specific and current information on parking areas, regulations, controls, commuting, violations, and penalties may be found in "Parking and Traffic Regulations" and the "University Bicycle Code," available at the University Police Department.



School of Agriculture and Biological Sciences

R.A. VOITLE, *Dean*

W. J. ALVERSON JR., *Assistant Dean*

R. DENNIS ROUSE, *Dean Emeritus*

CHARLES F. SIMMONS, *Dean Emeritus*

THE SCHOOL OF AGRICULTURE AND BIOLOGICAL SCIENCES prepares students for careers in agriculture and related professions. Courses provide a broad foundation in the basic sciences, a general knowledge of the applied sciences, and a reasonable number of cultural subjects. Most of the basic science courses are given in the freshman and sophomore years and serve as a basis for a better understanding of the applied or more practical subjects which are usually taken in the junior and senior years.

A curriculum is offered in Agricultural Science with majors in Agronomy and Soils, Animal and Dairy Sciences, Poultry Science, Horticulture, and Agricultural Journalism. Other curricula are offered in Agricultural Business and Economics; Agricultural Engineering; Biological Sciences, with majors in Botany, Fisheries Management, Wildlife Biology, Entomology, Zoology, Microbiology, and Marine Biology; Integrated Pest Management; Ornamental Horticulture, and Rural Sociology. Pre-Veterinary Medicine options are offered in Animal and Dairy Sciences, Entomology, Microbiology, Poultry Science, Wildlife Biology, and Zoology. If students wish to major in a field where the courses are not prescribed in the catalog they should consult with the dean.

The School of Agriculture and Biological Sciences also furnishes the subject matter training in Agriculture for the curriculum for training teachers of Vocational Agriculture.

Transfer credit will not normally be allowed for any course passed with a grade lower than C at any other college or university.

Credit toward a degree in any curriculum in the School of Agriculture and Biological Sciences will not be allowed for a mathematics course at a level lower than that specified in the curriculum. However, students who are not prepared to take the prescribed courses may take lower level courses without degree credit.

Transfer credit for agricultural subjects not considered equivalent to those required in the chosen curriculum may be substituted for elective credit; however, duplication of credit will not be allowed. Equivalency of agricultural subjects will be determined by the Dean's Office; however, students may also obtain transfer credit on the basis of validating examinations. Arrangements for validating examinations must be made with the Dean of Agriculture and Biological Sciences in the first quarter of enrollment in the School of Agriculture and Biological Sciences at Auburn and the examinations must be completed before the middle of the second quarter. Transfer credit in lieu of courses that are considered to be upper division courses in substance at Auburn University will not be accepted from two-year colleges.

Pre-Veterinary Medicine

It is possible to gain admission to the School of Veterinary Medicine upon completion of the minimum requirements listed below. Students may declare an option upon admission to the School of Agriculture and Biological Sciences and must declare an option by the end of their freshman year. If students are admitted to the School of Veterinary Medicine after the completion of all the requirements in the first three years of the option, they may obtain a Bachelor of Science degree in the option after completion of the freshman year of the School of Veterinary Medicine.

The minimum requirements for admission to the School of Veterinary Medicine, Auburn University (127 quarter hours), are as follows and are incorporated in the first three years of the options listed under the following curricula Animal and Dairy Sciences, Entomology, Microbiology, Poultry Science, Wildlife Biology, and Zoology.

EH 101, 102, 103	9	MH 160, 161	10	ADS 200	5	PO 209	5
EH 141	3	BI 101, 102, 103	15	ADS 220	5	Humanities, Fine Arts, &	
HY See Liberal Ed.		CH 103, 104, 105	15	ADS 320	4	Social Sciences	15
page 12		CH 207, 208	10	MB 300	5		
		PS 205, 206, 207	12	ZY 300	5		

Dual Degree Program With Engineering

This program gives students the opportunity to receive two baccalaureate degrees — one in Agriculture and one in Engineering. Although the program was developed primarily for students desiring a combination of a Biological Sciences program with an Engineering program, it does not preclude the consideration of other Agriculture-Engineering combinations.

In general, students will be enrolled in the School of Agriculture and Biological Sciences for approximately three years and in the School of Engineering for approximately two years. During the first three years, the students should take those mathematics, physics, and chemistry courses necessary to allow them to transfer to the School of Engineering. Additionally, before transferring to the School of Engineering, they should have completed approximately three-fourths of the total hours required by the School of Agriculture and Biological Sciences for the awarding of the degree.

To become dual-degree candidates under this program, students must have grade point averages which indicate the likelihood of satisfactory completion of Engineering School degree requirements and a recommendation from the Dean of the School of Agriculture and Biological Sciences. Recommendation should be sought one quarter before time of expected transfer to the School of Engineering.

It is also possible for very highly qualified students to transfer to the School of Engineering following the junior year with the intent of seeking a Master's Degree rather than a Bachelor's Degree in one of the Engineering disciplines. Consult the Engineering Dean's Office concerning this option.

Agricultural Science (AG)

FRESHMAN YEAR

First Quarter				Second Quarter				Third Quarter			
BI	101	Prin. of Biology	5	BI	102	Plant Biology	5	CH	104	Fund. Chem. & Lab.	5
MH	160	Pre-Cal. W. Trig.	5	CH	103	Fund. Chem. & Lab.	5	MH	151	Finite Math or	
EH	101	English Composition	3	EH	102	English Composition	3	MH	161	An. Geom. & Calc.	5
HY	101	World History	3	HY	102	World History	3	EH	103	English Composition	3
		ROTC or Elective	1			ROTC or Elective	1	HY	103	World History	3
										ROTC or Elective	1

SOPHOMORE YEAR

ADS	200	Intr. An. & Dairy Sciences	5	AEC	202	Agr. Economics I	5	ADS	220	An. Biochem. & Nut	5
BI	103	Animal Biology	5	AY	301	Prin. Grain Prod.	5	HF	201	Orchard Mgt.	5
PS	200	Fnds. of Physics	5	CH	207	Org. Chem. & Lab. or	5			Elective	5
		ROTC or Elective	1	CH	203	Org. Chem	5			ROTC or Elective	1
		Elective	1			ROTC or Elective	1			Elective	1
						Elective	1				

JUNIOR YEAR

PH	201	Poultry Science	5	MB	306	Fund. Plant Phys.	5	AY	304	General Soils	5
SC	202	App. Sp. Comm.	3	BY	309	Gen. Plant Path.	5	HF	308	Veg. Crops	5
		Ag. Eng. Elective*	5	JM	315	Technical Journalism	3			Ag. Eng. Elective*	5
		Elective	5			Elective	5			Elective	3

SENIOR YEAR

AY	401	Prin. Forage Prod.	5	AEC	301	Ag. Marketing	5	ADS		Elective**	5
FY	350	Farm Forestry	5	AY	404	Fiber & Oil Crops	5	AEC	501	Farm Management	5
		Electives	8			Electives	8	ZY	502	Econ. Entomology	5
										Elective	3

TOTAL — 210 QUARTER HOURS

*To be selected from AN 350, 351, 352, 353, and 354.

**May be selected from ADS 401, 403 or 407.

A list of the recommended electives is available in the offices of the adviser and Dean and must be approved by them.

Virtually all large agricultural firms, plus scores of agricultural related magazine companies, publish printed material on a regular basis for the general public and/or members of their organization. Editors and writers of such publications often require a specialized knowledge of agricultural subject matter and terminology as well as the ability to practice the requirement of accurate and responsible journalism. Likewise, Cooperative Extension Services and Agricultural Research Information Departments hire a wide variety of agricultural journalism graduates.

Four undergraduate options are available to students in Agronomy and Soils. They are (1) Science Option, for those who plan to pursue graduate work, (2) Production Option, (3) Business Option, and (4) Turf Management Option.

FRESHMAN YEAR			FRESHMAN YEAR			FRESHMAN YEAR		
First Quarter			Second Quarter			Third Quarter		
CH	103	Gen. Chem. ....4	BI	101	Prin. of Biology ....5	BI	102	Plant Biology ....5
CH	103L	Gen. Chem. Lab. ....1	CH	104	Gen. Chem. ....4	MH	161	An. Geom. & Cal. or
MH	160	Pre-Cal. w/Trig ....5	CH	104L	Gen. Chem. Lab. ....1	MH	151	Finite Math. ....5
AY	200	Crop Prod. ....5	EH	101	English Comp. ....3	EH	102	English Comp. ....3
		Elective* ....1	HY	101	History ....3	HY	102	History ....3
		ROTC or Elective* ....1			ROTC or Elective ....1			ROTC or Elective ....1
SOPHOMORE YEAR			SOPHOMORE YEAR			SOPHOMORE YEAR		
GL	110	Geology ....5	BI	103	Animal Biology or	AEC	202	Ag. Econ. ....5
CH	207	Org. Chem. ....4	ADS	220	An. Biochem. & Nutr. ....5	AY	304	Gen. Soils ....5
CH	207L	Org. Chem. Lab. 1 or	AY	301	Prin. of Grain Prod.** ....5	PS	205	Intr. Phys. or ....4
CH	203	Org. Chem. ....5	MB	300	Gen. Microbiol. ....5	PS	200	Funds Physics ....5
EH	103	English Comp. ....3			ROTC or Elective ....1			Elective ....1
HY	103	History ....3			Elective ....1			ROTC or Elective ....1
		ROTC or Elective ....1						
JUNIOR YEAR			JUNIOR YEAR			JUNIOR YEAR		
AY	312	Prin. of Weed Sci. ....5	SC	202	Appl. Sp. Comm. ....3	BY	309	Plant Path. ....5
BY	306	Fund. Plant Phys. ....5	ZY	300	Genetics ....5	AY	401	Prin. Forage Crops ....5
		Electives ....8			Electives ....10			Electives ....8
SENIOR YEAR			SENIOR YEAR			SENIOR YEAR		
ZY	502	Econ. Entomol. ....5	ADS	200	Int. An. &	AY	502	Soil Fertility ....5
EHA	304	Tech. Writing or			Dairy Sci.*** ....5			Electives ....13 or 14
EHA	415	Writt. Bus. Com. ....3	BST	216	Intr. Biol. Comp. ....3			
		Electives ....10			Electives ....10			

TOTAL — 210 QUARTER HOURS

*May choose an elective from Humanities and Fine Arts, and Social Sciences.

**Students in Turf will take AY 315.

***Not required in Turf option.

The student will consult with his adviser concerning the option and elective courses that should be taken. Lists of courses are available in the offices of the adviser and Dean, and must be approved by them.

Animal and Dairy Sciences (ADS)

Two curriculum options are available within the ADS Department to accommodate students with varied career goals and prepare them for leadership careers in livestock and related industries. The Production/Agribusiness/Extension option offers students flexibility in designing a custom-made program by selection of professional electives. Upon completion of this option, graduates should be qualified for career opportunities in livestock production, journalism, extension, livestock feed/nutrition, pharmaceutical industry, sales and merchandising, agricultural finance, governmental and private agencies, and industries related to the processing of meat products.

Contemporary animal agriculture is expanding into a "high tech" era which needs graduates with basic science backgrounds to aid in discovery and development of new concepts for animal production. The Pre-veterinary/Basic-Science (ADPV) option provides students with a foundation in biological and physical science necessary for entry into graduate programs in biotechnology and related disciplines while satisfying prerequisites for veterinary school. Postgraduate studies are necessary for most positions in teaching, extension and research at universities and allied animal industries, as well as areas of biotechnology.

Production/Agribusiness/Extension Option (ADS)

FRESHMAN YEAR			FRESHMAN YEAR			FRESHMAN YEAR		
First Quarter			Second Quarter			Third Quarter		
MH	140	College Algebra or	CH	104	Fund. of Chem. I ....4	CH	105	Fund. of Chem. ....4
MH	151	Finite Mathematics ....5	CH	104L	Chem. Lab. ....1	CH	105L	Chem. Lab. ....1
EH	101	English Comp. ....3	MH	160	Pre-Cal w/Trig ....5	MH	161	An. Geom. & Calc. ....5
ADS	200	Int. An. & Dairy Sci. ....5	HY	102	World History ....3	HY	103	World History ....3
ADS	110	Orient. to Anim. &	EH	102	English Comp. ....3	EH	103	English Comp. ....3
		Dairy Science. ....1			ROTC or Elective ....1			ROTC or Elective ....1
HY		Requirement* ....3			Elective ....1			Elective ....1
		ROTC or Elective ....1						
		Elective ....1						

SOPHOMORE YEAR

CH 203 Organic Chem. or	PS 200 Fund of Physics5	AEC 202 Agr. Economics5
CH 207 Organic Chem.4	MB 300 Gen. Microbiol.5	ZY 300 Genetics5
CH 207L Organic Chem. Lab . . .1	ADS 260 Growth & Body	SC 211 Public Speaking5
ADS 220 An. Biochem. & Nutr. . .5	Comp.4	Fine Arts Elective3
BI 103 Animal Biol.5	Elective2	ROTC or Elective1
Elective1	ROTC or Elective1	

JUNIOR YEAR

ADS 320 Feeds & Feeding4	ADS 350 Animal Breeding5	ADS 361 Repro Physiol.5
ZY 316 Physiol. Dom. Anim.5	ADS 370 Meat Science5	Communications
AY 304 Soils5	Elective4	Req.**3 or 5
Prof. Elective†3	Prof. Elective†3	ADS 380 Undergrad Sem1
		AY 301 Grains or
		AY 401 Forage Production5
		Prof. Elective†3

SENIOR YEAR

AEC 501 Farm Mgt5	ADS Production Req.***5	Prof. Elective†17
ADS Production Req.***5	Prof. Elective†12	
Prof. Elective†7		

TOTAL — 210 QUARTER HOURS

*World History 101-102-103 (3-3-3) or Technology & Civilization 204-205-206 (3-3-3) or World Literature (EH) 260-261-262 (3-3-3) or Art History 171-172-173 (3-3-3).

**EHA 304 (3), EHA 315 (3) or SC 511 (5).

***A minimum of 10 hrs. from ADS 401 (5), ADS 403 (5), ADS 405 (5), and ADS 407 (5).

†A minimum of 45 credit hrs. must be taken from the list of electives for one of the suggested options that is available in the offices of the adviser and the dean and must be approved by them.

Pre-Veterinary Medicine/Basic Science Option (ADPV)

The curriculum listed in the first nine quarters (161 quarter hours) will satisfy the minimum requirements for admission to the School of Veterinary Medicine. Satisfactory completion of the remaining requirements of the Animal-Dairy Science curriculum or completion of one year in the Veterinary Medicine curriculum entitles the student to the B.S. degree in Animal and Dairy Sciences.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH	103	Fund. of Chem. ....4	CH	104	Fund. of Chem. ....4	CH	105	Fund. of Chem. ....4
CH	103L	Chem. Lab. ....1	CH	104L	Chem. Lab. ....1	CH	105L	Chem. Lab. ....1
ADS	200	Int. An. & Dairy Sci. ....5	MH	160	Pre-Cal w/Trig ....5	MH	161	An Geom. & Calc. ....5
HY	101	World History ....3	HY	102	World History ....3	HY	103	World History ....3
EH	101	English Comp. ....3	EH	102	English Comp. ....3	EH	103	English Comp. ....3
ADS	110	Orient. to ADS ....1			ROTC or Elective ....1			ROTC or Elective ....1
					Elective ....1			Elective ....1

SOPHOMORE YEAR

BI 101 Prin. Biology5	BI 103 Animal Biology5	BI 102 Plant Biology5
CH 207 Org. Chemistry4	CH 208 Org. Chemistry3	ZY 316 Physiol. Dom.5
CH 207L Org. Chem. Lab1	CH 208L Org. Chem. Lab2	Anim.5
ADS 260 Growth & Body	ADS 220 Anim. Biochem. &	PS 205 Intr. Physics I3
Comp.4	Nutr.5	PS 205L Physics Lab3
ROTC or Elective1	EH 141 Med. Vocab.3	EHA 304 Technical Writing1
	ROTC or Elective1	ROTC or Elective1

JUNIOR YEAR

PS 206 Intr. Physics II3	ADS 361 Reproductive	ADS 350 Animal Breeding5
PS 206L Physics Lab1	Physiol.5	AEC 202 Agr. Economics5
MB 300 Microbiology5	AY 304 General Soils5	PO 209 American Govt.5
ZY 300 Genetics5	PS 207 Intr. Physics III3	ADS 380 Undergrad. Seminar1
ADS 370 Meat Science5	PS 207L Intr. Physics Lab1	Elective3
	ADS 320 Feeds & Feeding4	

SENIOR YEAR

SC	211	Public Speak	5	AEC	501	Farm Mgt.	5	AY	401	Forage Prod*	5
ADS		Prod. Req**	5	ADS		Prod. Req.**	5	ADS		Prod. Req.	5
		Prof. Elective†	7			Prof. Elective†	7			Prof. Elective†	5

TOTAL — 210 QUARTER HOURS

*AY 401 (5) or AY 301 (5).

**A minimum of 10 hrs. from ADS 401 (5), ADS 403 (5), ADS 405 (5) and ADS 407 (5).

†A minimum of 19 hrs. must be taken from the list of electives for the ADPV option available in the office of the adviser and Dean and must be approved by them.

Horticulture (HF)

The Horticulture major is designed to prepare the student for a future in the fruit or vegetable industry. Advanced study in Horticulture leads to professional positions in teaching, research, or extension.

FRESHMAN YEAR

First Quarter				Second Quarter				Third Quarter			
BI	101	Prin. of Biology	5	BI	102	Plant Biology	5	CH	104	Fund. Chem. & Lab.	5
MH	160	Pre-Cal. w. Trig	5	EH	102	English Comp.	3	MH	161	An. Geom. & Cal. or	
EH	101	English Comp.	3	HY	101	World History	3	MH	151	Finite Math	5
HF	101	Intr. to Hort.	3	CH	103	Fund. Chem. & Lab. or	5	EH	103	English Comp.	3
		ROTC or Elective	1			ROTC or Elective	1	HY	102	World History	3
		Elective	1			Elective	1			ROTC or Elective	1
										Elective	1

SOPHOMORE YEAR

HF	224	Plant Propagation	5	AEC	210	Micro. Comptr. or		GL	110	Physical Geo.	5
HF	221	Landscape Garden	5	BST	216	Intr. Bio. Comptr.	3	HF	201	Orchard Mgt.	5
SC	211	Public Speaking	5	AEC	202	Ag. Economics I	5	PS	200	Fnds. of Physics	5
HY	103	World History	3	CH	207	Organic Chem. & Lab. or				ROTC or Elective	1
		ROTC or Elective	1	CH	203	Organic Chem.	5				
				JM	315	Tech. Journalism	3				
						ROTC or Elective	1				

JUNIOR YEAR

AN	350	Soil and Water Technology	5	AEC	301	Ag. Marketing	5	AY	502	Soil Fertility	5
BY	306	Fund. of Plant Physiology	5	HF	308	Vegetable Crops	5	BY	309	Plant Pathology	5
		Electives	8	AY	304	General Soils	5	ZY	300	Genetics	5
						Elective	3			Elective	3

SENIOR YEAR

AEC	501	Farm Management	5	HF		Elective*	5	HF	501	Com. Veg. Crops	5
AY	312	Weed Sci	5			Agri. Engineering	5	ZY	502	Economic Entomol.	5
		Elective	6			Elective	5	HF		Elective*	5
						Elective	6			Elective	3

TOTAL — 210 QUARTER HOURS

*Students are required to take two of the following Horticulture electives: HF 504, Fruit Growing; HF 505, Small Fruits; HF 506, Nut Culture.

Poultry Science (PH)

The program is designed to allow students to choose courses in science and business. In most cases students anticipating study beyond the B.S. degree should choose electives for the science option. The electives in the business area provide the student opportunity to prepare for sales, service, and related agribusiness professions.

FRESHMAN YEAR

First Quarter				Second Quarter				Third Quarter			
CH	103	Fund. Chem I	4	CH	104	Fund. Chem II	4	BI	103	Animal Biology	5
CH	103L	Fund. Chem Lab	1	CH	104L	Fund. Chem Lab	1	EH	102	English Comp.	3
MH	160	Pre Cal. w/Trig.††	5	MH	151	Finite Math†† or	3	HY		Requirement**	3
PH	201	Poultry Science	5	MH	161	An. Geom. & Cal	5	CH	203	Organic Chem.	5
		Basic ROTC or		EH	101	English Comp.	3			or	
		Elective*	1	BI	101	Prin. of Biology	5	CH	207	Organic Chem.	4
		Elective*	1			Basic ROTC or		CH	207L	Organic Chem. Lab	1
						Elective	1			Basic ROTC or	
										Elective	1
										Elective	1

SOPHOMORE YEAR

HY		Requirement**	3	HY		Requirement**	3	ZY	300	Genetics	5
ADS	220	Intr. An Nutr.	5	PS	200	Fund. of Physics	5	PG	211	Psychology	5
EH	103	English Comp.	3	AEC	202	Agr. Econ.	5	SC	211	Public Speaking	5
PH	315	Poul. Physiol.	5	BST	216	Intr. Bio. Comptr. or				Prof. Electives***	3
		Basic ROTC or		AEC	210	Microcmpr. Appl.				Basic ROTC or	
		Elective*	1			In Ag	3			Elective*	1
		Elective*	1			Basic ROTC or					
						Elective	1				

JUNIOR YEAR

AY	304	Soils	5	SC	273	Group Prob. Solv.	5	PH	506	Fert. & Hatch	5
MB	300	Gen. Microbiology	5	PH	501	Comm. Meat Prod.	5	PH	410	Poultry Breeding	3
		Plant Sci. Elective†	5			Prof. Electives***	8			Prof. Electives***	9
		Prof. Electives***	3								

SENIOR YEAR

PH	505	Poultry Feeding	5	PH	502	Comm. Egg Prod	5	AEC	510	Agri. Bus. Mgt. or	3
ZY	502	Economic Entom.	5			Prof.		AEC	501	Farm Mgt	5
PH	401	Jr.-Sr. Seminar	1			Electives***	10 or 12	PH	508	Cont. Poul. Dis & Par	5
		Prof. Electives***	8					PH	511	Proc. & Mkt	5

TOTAL — 210 QUARTER HOURS

*Students may choose electives from humanities and social sciences categories.

**World History 101, 102, 103 (9); or Technology and Civilization 204, 205, 206 (9); or World Literature 260, 261, 262 (9); or Art History 171, 172, 173 (9).

***A minimum of 41 or 43 credit hours must be taken from the list of electives that is available in the office of the adviser and the dean.

†Principles of Grain Prod AY 301 (5) or Crop Prod AY 200 (5) or Principles of Forage Prod AY 401 (5) or Orchard Mgt HF 201 (5) or Vegetable Crops HF 308 (5) or Farm Forestry FY 350 (5).

††Students in the terminal production curriculum may substitute college Algebra MH140 for MH160 and Biological statistics BST215 for MH151 or MH161.

Poultry Science Pre-Veterinary Medicine Option (PH-PV)

FRESHMAN YEAR

First Quarter				Second Quarter				Third Quarter			
CH	103	Fund. of Chem I	4	CH	104	Fund. of Chem II	4	CH	105	Fund. of Chem III	4
CH	103L	Gen. Chem. Lab	1	CH	104L	Gen. Chem. Lab	1	CH	105L	Gen. Chem. Lab	1
MH	160	Pre-Cal w/Trig	5	MH	161	An. Geom. & Cal	5	BI	101	Prin. of Biology	5
HY	*		3	HY	*		3	HY	*		3
PH	201	Poultry Science	5	EH	101	English Comp	3	EH	102	English Comp	3
		ROTC or Elect	1			ROTC or Elect	1			ROTC or Elect	1

SOPHOMORE YEAR

CH	207	Org. Chem	4	CH	208	Org. Chem	3	PS	206	Intr. Physics II	3
CH	207L	Org. Chem. Lab	1	CH	208L	Org. Chem. Lab	2	PS	206L	Physics Lab	1
BI	103	Animal Biology	5	BI	102	Plant Biology	5	MB	300	Gen. Microbiol.	5
EH	103	English Comp	3	PS	205	Intr. Physics I	3	ADS	220	An. Biochem. & Nut	5
PH	315	Poultry Physiol	5	PS	205L	Physics Lab	1			ROTC or Elect	1
		ROTC or Elect	1	BST	216	Intr. Bio Comptr. or				Elective	3
				AEC	210	Microcmpr. Appl.					
						In Ag	3				
						ROTC or Elect	1				

JUNIOR YEAR

ZY 300 Genetics	5	PG 211 Psychology	5	PO 209 American Gov't	5
ADS 200 Intr. An. & Dairy Science	5	AEC 202 Ag. Economics I	5	ADS 320 Feeds & Feeding	4
PH 505 Poultry Feeding	5	PH 501 Comm. Meat Prod	5	PH 506 Fert. & Hatch	5
PS 207 Intr. Physics III	3	EH 141 Med. Vocab	3	PH 511 Proc. & Mkt	5
PS 207 Physics Lab	1				

In the event the first-year Veterinary School alternative is not followed, the following must be completed successfully to receive the B.S. degree in Poultry Science.

ZY 502 Economic Entomol.	5	AEC 510 Agri. Bus. Mgt.	3
SC 211 Public Speaking	5	or	
PH 401 Jr.-Sr. Seminar	1	AEC 501 Farm Mgt.	5
AY 304 Soils	5	PH 508 Cont. Poul. Dis. & Par.	5
PH 502 Com. Egg Prod	5	PH 410 Poul. Breeding	3
SC 273 Group Prob. Solving	5	Electives	7
		or 9	

TOTAL — 210 QUARTER HOURS

*World History 101, 102, 103 (9) or Technology and Civilization 204, 205, 206 (9) or World Literature 260, 261, 262 (9) or Art History 171, 172, 173 (9).

Electives must be taken from a list available in the office of the dean in consultation with the student's adviser.

Agricultural Business and Economics (AEC)

The curriculum in Agricultural Business and Economics is for students who plan a career in agriculture or closely related business; and for those interested in the economics of agricultural production, marketing, public policies affecting agriculture, and natural resources.

Optional career paths provide specialized training for students interested in agribusiness and marketing, farm management, and natural resources. The curriculum combines business management and technical agricultural courses, and through selection of electives, it provides an opportunity for students to emphasize training in agribusiness aspects of other disciplines such as food science or selected production fields.

The demand for graduates who have both business and applied agricultural or natural resource training is increasing. In both public and private agencies, increasing attention to rural economic and social problems points to enlarged opportunities for qualified workers in farming, sales, public relations, services, extension, administration, and private employment in domestic and international arenas. By electing appropriate courses, Agricultural Business and Economics students can prepare for a wide variety of positions in the food industry, environmental management, and international economics as well as the traditional agricultural fields.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 160 Pre-Cal w/Trig.	5		MH 161 An. Geom & Cal.	5		CH 104 Fund. Chem. II	4	
BI 101 Prin. of Biology	5		CH 103 Fundamental Chem I ..	4		CH 104L Chem. Lab	1	
EH 101 English Comp.	3		CH 103L Chem. Lab	1		BI 102 Plant Biology or ..		
HY 101 History*	3		EH 102 English Comp	3		BI 103 Animal Biology	5	
AEC 101 Intr. to Ag Econ	1		HY 102 History*	3		EH 103 English Comp.	3	
ROTC or Elective	1		ROTC or Elective	1		AEC 202 Ag. Econ. I	5	
						ROTC or Elective	1	

SOPHOMORE YEAR

PS 200 Fund Physics	5	PO 209 Amer. Gov't	5	MN 274 Statistics** or ..	
AEC 206 Ag Econ II	5	MN 207 Intr. Comp Prog** or ..		BST 215 Intr. Bio Stat	5
HY 103 History*	3	BST 216 Intr. Bio. Compr.	3	RSY 261 Rural Soc	5
SC 202 Applied Speech Com.	3	ACF 211 Accounting I	4	ACF 212 Accounting II	4
AEC 210 Micro. Compr.	3	PH 201 Poultry Science or ..		Electives	3
ROTC or Elective	1	ADS 200 Intr. An. Sci.	5	ROTC or Elective	1
		ROTC or Elective	1		

JUNIOR YEAR

AY 307	Gen Soils	5	AY 200	Crop Production***	5	AN 351	Ag. Mach. Tech.	5
AEC 301	Ag. Mktg.	5	ADS 220	Anim. Bio. & Nutr. or		EC 360	Money and Bank	5
EHA 304	Tech. Writing	3	ADS 320	Feeds & Feeding	4		Electives	5
	Electives	3	AEC 307	Ag. Law	5			
				Electives	3			

SENIOR YEAR

AEC 510	Ag. Bus. Mgt.	3	AEC 501	Farm Mgt.	5	AEC 505	Ag. Policy	3
AEC 509	Resource Econ.	5	AEC 503	Ag. Prices	3		Electives	13 or 14
EHA 415	Written Bus. Comm.	3	AEC 490	Sen Seminar	1			
	Electives	5		Electives	10			

TOTAL — 210 QUARTER HOURS

*HY 204, HY 205, HY 206 may be substituted.

**If MN 207 is taken, student must take MN 274.

***AY 301 or AY 401 may be substituted.

†AN 350, AN 352, AN 353, or AN 354 may be substituted.

Career Path Options. Undergraduate AEC majors may select one of three career paths, (I) Agribusiness and Marketing, (II) Farm Management, or (III) Natural Resource Economics, but are not required to do so. To concentrate studies in a career path option, a minimum of 20 hours are to be taken from the chosen option group of electives. If option not chosen, a minimum of 30 hours of recommended electives must be taken. A list of recommended electives is available in the offices of the adviser and Dean and must be approved by them.

AEC 399, Agricultural Business and Economics Internship. Up to 10 hours credit is available subject to arrangements with approved firms or businesses.

Rural Sociology (RSY)

The Rural Sociology curriculum emphasizes the application of scientific knowledge to human problems. Course sequence provides a fundamental preparation in the humanities, mathematics, and the sciences, as well as in the basics of production agriculture. The core of the curriculum is composed of a major in rural sociology coupled with a minor in agricultural economics and broad exposure to other social and agricultural sciences.

Human services occupations represent an area of expanding employment opportunity. Graduates are qualified for work involving administration of state and federal programs designed to serve the elderly, handicapped, poor, youth, unemployed, and others. Employment opportunities exist in regional and urban planning units, agricultural agencies, agribusiness firms and other organizations desiring employees with human relations as well as agricultural and economics skills.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 160	Pre-Cal. w/Trig.	5	MH 161	An. Geom. Cal.	5	CH 103	Fund. Chem. & Lab	5
BI 101	Prin. of Biology	5	BI 102	Plant Biology	5	BI 103	Animal Biology	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY	Requirement*	3	HY	Requirement	3	RSY 261	Rural Sociology	5
	ROTC or elective	1		ROTC or elective	1		ROTC or elective	1

SOPHOMORE YEAR

CH 104	Fund. Chem. & Lab	5	PO 210	S&L Govern	5	SY 220	Statistics**	5
HY	Requirement*	3	ADS 200	Intr. An. & Dairy Sc.	5	RSY 362	Community Org.	5
AEC 202	Ag. Econ. I	5	PG 212	Dev. Psychology	3	AY 200	Crop Prod.	5
SY 204	Soc. Behavior	5	AEC 206	Ag. Econ II	5	MN 207	Intr. Comp. Prog.**	3
	ROTC or elective	1		ROTC or elective	1		ROTC or elective	1

JUNIOR YEAR

AEC 301	Ag. Marketing	5	PH 201	Poultry Sci. or		EHA 315	Bus. & Prof. Report	
RSY 370	Meth. of Soc. Res.	5	FY 350	Farm Forestry	5		Writing	3
AY 307	Gen. Soils	5	AEC 304	Ag. Finance	5	RSY 561	Rur. Soc. Org.	5
	Elective	3	PO 325	Intr. Pub. Adm.	5	SW 376	Comm. Soc. Services	5
			SC 202	App. Speech Comm.	3		Elective	3

SENIOR YEAR

SY	502	Soc. Theory	5	AEC	505	Ag. Policy	3	RSY	541	Ext. Prog. & Meth.	5
AEC	510	Ag. Bus. Mgt.	3	RSY	562	Soc. of Comm. Dev.	5	RSY	565	Soc. Nat. Res. & Env.	5
RSY	498	Dir. Field Exp.	5	AEC	490	Senior Seminar	1	RP	474	Intr. Planning	3
		Electives	3			Electives	7			Electives	3

TOTAL — 210 QUARTER HOURS

*Select one of four sequences: World History HY 101-2-3 (9); or Technology & Civilization HY 204-5-6 (9); or Survey of Western Literature EH 260-1-2 (9); or Art History AT 171-2-3 (9).

**Or Equivalent Course

Student is encouraged to select electives in areas of agriculture and social sciences.

Agricultural Engineering (AN)

The Agricultural Engineering curriculum provides graduates with engineering skills necessary to serve the nation's largest industry — agriculture. In addition to a strong background in mathematics, physical sciences, and basic engineering fundamentals, agricultural engineering students receive training in biological agricultural sciences. Through technical electives in the senior year, one can specialize in one or more areas to include soil and water conservation, power and machinery design, electric power and processing, agricultural structures and environment, food engineering, and waste management, and agricultural pollution control.

The curriculum is coordinated by the School of Engineering and the School of Agriculture. Students register in the School of Agriculture. A student in the pre-engineering program can transfer without loss of credit.

FRESHMAN YEAR

First Quarter

MH	161	An. Geom. & Cal.	5
CH	103	Fund. Chem. I	4
CH	103L	Gen. Chem. Lab	1
EH	101	English Comp	3
IE	102	Graph. Comm. & Design	2
HY		History Elective**	3

Second Quarter

MH	162	An. Geom. & Cal.	5
CH	104	Fund. Chem. II	4
CH	104L	Gen. Chem. Lab	1
EH	102	English Comp	3
AN	101	Orient. to Ag. Engr.	1
HY		History Elective**	3

Third Quarter

MH	163	An. Geom. & Cal.	5
PS	220	Gen. Physics I	3
PS	220L	Gen. Physics Lab I	1
EH	103	English Comp	3
HY		History Elective**	3
CSE	204	Computer Programming	3

SOPHOMORE YEAR

MH	264	An. Geom. & Cal.	5
PS	221	Gen. Physics II	3
PS	221L	Gen. Physics Lab II	1
AN	201	Ag. Engr. Principles	5
ME	205	Appl. Mech.-Statics	4

MH	265	Diff. Equations	3
PS	222	Gen. Physics III	3
PS	222L	Gen. Physics Lab. III	1
ME	207	Stren. of Mat. I	3
AEC	202	Ag. Economics I	5
		Hum.-Soc. Elective*	3

BI	101	Prin. of Biology	5
ME	301	Thermodynamics I	4
ME	321	Dynamics I	4
MH		Math Elective	3

JUNIOR YEAR

CE	310	Hydraulics I	3
EE	302	Elec. Engr. I	3
EE	330	Anal. & Design of Logic Circuits	4
AY	307	General Soils	5
SC	202	Applied Speech Comm or	
EHA	304	Technical Writing	3

AN	311	Agric. Machin. & Power Units	5
AN	315	Agric. Processing & Food Engineering	5
AN	420	Seminar	1
ME	316	Stren. of Mat. II	4
EE	303	Intr. to Elec. Eng. II	3

AN	313	Conser. & Water Mgt. Engr.	6
AN	316	Elec. Systems in Agriculture	5
AN	317	Environment of Ag. Structures & Waste Mgmt.	6

SENIOR YEAR

AN	403	Ag. & Forest Struc. Design	3
		Ag. Elective	5
		Engr. Science Elective	5
		Hum.-Soc. Elective*	3

AN	430	Agric. & Forest Engr. Design I	3
IE	360	Engr. Economic Analysis	3
		Ag. Elective	5
		Technical Elective	7

AN	530	Agric. & Forest Engr. Design II	3
		Hum.-Soc. Elective*	9
		Technical Elective	6

TOTAL — 210 QUARTER HOURS

*Selected from Anthropology, Art, Economics, History, Literature, Philosophy, Political Science, Psychology, Religion, Sociology, Theatre.

**Selected from Technology & Civilization HY 204, 205, 206 or World History HY 101, 102, 103.

A list of recommended electives is available in the offices of the adviser and Dean.

Electives must be approved by them.

Basic ROTC may be substituted for three hours of Humanistic-Social Science electives.

Advanced ROTC may be substituted for SC 202 (3 hrs) or EH 304 (3 hrs) and three additional hours approved by the Department Head.

Biological Sciences (BI)

Botany (BY)

The Botany major is for those students interested in fundamental plant science. The required courses serve as a basis for knowledge of plants and future experimentation with plant systems. Proper elective selection prepares students for various careers in the plant sciences. The curriculum is administered through a faculty advisory system for the best interests and needs of each student.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI	101	Prin. of Biology5	BI	102	Plant Biology5	BI	103	Animal Biology5
MH	160	Pre-Cal. w/Trig5	MH	161	An. Geom. & Cal.5	CH	103	Fund. Chem. & Lab.5
EH	101	English Comp.3	EH	102	English Comp.3	EH	103	English Comp.3
HY	101	World History3	HY	102	World History3	HY	103	World History3
		ROTC or Elective1			ROTC or Elective1			ROTC or Elective1

SOPHOMORE YEAR

CH	104	Fund. Chem. & Lab.5	CH	207	Org. Chem. & Lab.5	MB	300	Gen. Micro-Biology I5
ZY	300	Genetics5	BY	309	Gen. Plant Pathology5	CH	208	Org. Chem. & Lab.5
EC	200	Gen. Economics or	GL	110	Phys. Geol.5	ZY		Zoology Elective5
AEC	202	Ag. Economics I5			ROTC or Elective1			ROTC or Elective1
		ROTC or Elective1			Elective1			Elective1

JUNIOR YEAR

EH	141	Med. Vocab.3	PS	206	Intr. Physics II & Lab.4	PS	207	Intr. Physics III & Lab.4
PS	205	Intr. Physics I & Lab.4	AY	304	General Soils5	BY	306	Fund. Plant Physiology5
BST	215	Intr. Biol. Stat. or	EHA	304	Tech. Writing or	PA		Philosophy Elec.3
BST	501	Bio. Statistics5	EHA	315	Bus. & Prof. Writing3			Electives6
		Electives6			Electives6			

SENIOR YEAR

BY	513	Gen. Plant Ecol5	BY	535	Plant Dev.: Cells & Tissues or	BY	506	Systematic Botany5
FL	121	French or			536 Plant Dev.: Organs5			Electives13
FL	151	German5	FL	122	French or			
ZY		Zoology Elective5	FL	152	German5			
		Elective3			Electives8			

TOTAL — 210 QUARTER HOURS

Students in consultation with their academic advisers should take a minimum of 10 hours of electives in each of the three areas of Science and Mathematics, Humanities and Fine Arts, and Social Studies.

Microbiology (MB)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI	101	Prin. of Biol.5	MH	161	An. Geom. & Cal.5	CH	104	Fund. Chem. & Lab.5
MH	160	Pre-Cal. w/Trig5	EH	102	English Comp.3	EH	103	English Comp.3
EH	101	English Comp.3	HY	102	World History3	HY	103	World History3
HY	101	World History3	CH	103	Fund. Chem. & Lab.5	BI	102	Plant Biology5
		ROTC or Elective1			ROTC or Elective1			ROTC or Elective1

SOPHOMORE YEAR

BI	103	Animal Biology	5	CH	208	Org. Chem. & Lab.	5	PS	207	Intr. Physics III & Lab.	4
PS	205	Intr. Physics I & Lab.	4	FL	121	French or		MB	300	Gen. Microbiol.	5
CH	207	Org. Chem. & Lab.	5	PS	206	Intr. Physics II & Lab.	4	FL	122	French or	
EH	141	Med. Vocab.	3			Elective	3	FL	152	German*	5
		Elective	1							Elective	3

JUNIOR YEAR

ZY	300	Genetics	5	CH	519	Biochemistry	5	AEC	202	Ag. Econ. or	
CH	518	Biochemistry	5	MB	543	Immunology	5	EC	200	Gen. Economics	5
PA		Philosophy Elective	3	MB	503	Bacterial		MB	446	Clin. and Path.	
		Electives	5			Taxonomy	5			Microbiol.	5
						Elective	3			Electives	7

SENIOR YEAR

MB	540	Microbial Phys. and Genetics	3			Electives	18			Electives	18
		Electives	15								

Electives may be selected from the following groups with at least 11 hours from A, an additional 30 from A or B, and the remaining from groups A, B, or C.

Group A

BST	215	Intr. Biol. Stats.	5	CH	316	Physical Chemistry	5
MB	504	Industrial Microbiology	3	CH	520	Clinical Biochemistry	5
BY	505	Intr. Mycology	5	EHA	304	Technical Writing	3
MB	522	Gene Expr. & Recomb. DNA	5	FAA	516	Biological Productivity & Water Quality	5
MB	541	Environmental Microbiology	5	HF	543	Food Anal. & Qual. Ctrl.	5
MB	542	Virology	5	LT	301	Hematology	5
MB	545	Microbial Phys. Lab	3	MT	344	Environmental Law	4
BY	554	Physiology of Fungi	5	SC	211	Public Speaking	5
MB	556	Food Microbiology	5	U	270		

Group B

ADS	515	Food Plant Sanitation	5		271		
BST	216	Intr. Biol. Computat.	3	ZY	272	Ascent of Man	9
BY	309	Gen. Plant Pathology	5	ZY	310	Cell Biology	5
MB	508	Marine Microbiology	7	ZY	511	Parasitology	5
BY	514	Biological Microscopy	5	ZY	524	Animal Physiology	5
MB	521	Industrial Microbiology Lab	3				

Group C

University courses not included in Groups A or B. Selection to be determined in consultation with adviser.

TOTAL — 210 QUARTER HOURS

During the Sophomore Year students will develop a plan of study for the Junior and Senior Years from lists of approved elective courses with the assistance and approval of their adviser and dean. Substitutions may be permitted to meet specific needs of individual students.

*Any foreign language acceptable; French or German preferred.

Microbiology Pre-Veterinary Medicine Option (MB-PV)

FRESHMAN YEAR

First Quarter				Second Quarter				Third Quarter			
EH	101	English Comp	3	EH	102	English Comp	3	EH	103	English Comp	3
HY	101	World History	3	HY	102	World History	3	HY	103	World History	3
CH	103	Fund of Chem & Lab	5	CH	104	Fund of Chem & Lab	5	CH	105	Fund of Chem & Lab	5
BI	101	Prin of Biology	5	MH	160	Pre-Cal w/Trig	5	MH	161	An. Geom. & Cal	5
		ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1

SOPHOMORE YEAR

PS	205	Intr. Physics I & Lab.	4	PS	206	Intr. Physics II & Lab.	4	PS	207	Intr. Physics III & Lab.	4
CH	207	Org. Chem. & Lab.	5	CH	208	Org. Chem. & Lab.	5	MB	300	Gen. Microbiol.	5
ADS	200	Intr. An. & Dairy Science	5	EH	141	Med. Vocab.	3	BI	103	Animal Biology	5
PA		Philosophy Elec	3	ADS	220	An. Biochem & Nutr.	5	ADS	320	Feeds and Feeding	4
		ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1

JUNIOR YEAR

MB 540	Mic. Phys. & Gen.	3	MB 543	Immunology	5	MB 446	Clin. & Path.	
ZY 300	Genetics	5	MB 503	Bact. Taxonomy	5		Microbiol.	5
CH 518	Biochemistry	5	CH 519	Biochemistry	5	PO 209	American Govt.	5
BI 102	Plant Biology	5		Electives	3	AEC 202	Ag. Econ. or	
						EC 200	Gen. Economics	5
							Electives	3

In the event the first-year Veterinary School alternative is not followed, the following must be completed successfully to receive the B.S. degree in Microbiology.

FL 121	French or		FL 122	French or	
FL 151	German*	5	FL 152	German*	5
				Electives	41

TOTAL — 210 QUARTER HOURS

*Any foreign language acceptable; French or German preferred.

During the Sophomore Year students will develop a plan of study for the Junior and Senior year from lists of approved elective courses with the assistance and approval of their adviser and dean. See recommended group electives for Microbiology Curriculum (MB). Substitutions may be permitted to meet specific needs of individual students.

Biological Statistics (BST)

The program in Biological Statistics is administered by the Department of Botany, Plant Pathology, and Microbiology. The program is designed to provide undergraduate students with an introduction to statistics, computer applications, and computer programming. Graduate students with interest in agriculture, forestry or the biological sciences may obtain a minor in applied biological statistics if they so desire.

Zoological Sciences
(Animal Biology)

Majors in zoological sciences are for students interested in careers in animal biology. One has the choice of nine degree programs including three pre-veterinary medicine options: Zoology, Zoology/Pre-vet, Entomology, Entomology/Pre-vet, Integrated Pest Management, Wildlife Biology, Wildlife Biology/Pre-vet, Marine Biology, and Fisheries. The Department of Zoology-Entomology administers all of these degree programs except the last which is administered by the Department of Fisheries and Allied Aquaculture.

Zoology (ZY)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI 101	Prin. Biology	5	BI 102	Plant Biology	5	BI 103	Animal Biology	5
CH 103	Fund. Chem. I	4	CH 104	Fund. Chem. II	4	MH 162	An. Geom. & Cal.	5
CH 103L	Gen. Chem. Lab	1	CH 104L	Gen. Chem. Lab	1	CH 207	Organic Chem	4
MH 160	Pre-Cal. w/Trig	5	MH 161	An. Geom. & Cal	5	CH 207L	Org. Chem. Lab	1
	Electives	2		Electives	2		Electives	2

SOPHOMORE YEAR

CH 208	Organic Chem	3	ZY 303	Syst. & Evol.	5	ZY 306	Prin. of Ecol.	5
CH 208L	Org. Chem. Lab	2	ZY 310	Cell Biology	4	MB 300	Gen. Microbiol.	5
ZY 300	Genetics	5	ZY 310L	Cell Biology Lab	2	EH 103	English Comp.	3
EH 101	English Comp	3	EH 102	English Comp	3	HY 103	World History	3
HY 101	World History	3	HY 102	World History	3		Elective	1
	Elective	1		Elective	1			

JUNIOR YEAR

ZY 200	Gen. Entomol.	5	ZY 301	Compar. Anatomy	5	ZY 511	Gen. Parasitol.	5
EH 390	Adv. Comp or		PS 206	Intr. Phys. & Lab	4	ZY 524	Animal Physiol.	5
SC 211	Public Speaking	5		Electives	8	PS 207	Intr. Phys. & Lab	4
PS 205	Intr. Phys. & Lab	4					Electives	3
	Electives	3						

SENIOR YEAR

AEC	202	Ag. Econ. I	5	ZY	501	Invert. Zoology	5	Electives	18
ZY	521	Vert. Zoo. I or				Electives	15		
ZY	522	Vert. Zoo. II	5						
		Electives	8						

TOTAL — 210 QUARTER HOURS

Electives must be approved by Adviser and will include at least 17 hours of humanities and social sciences and 35 hours of group electives selected from a list available from the Adviser or Dean. At least 10 hours of group electives must be selected from the following: BY 306, 309, 506, 509, 513, and 516.

Zoology-Pre-Vet Option (ZY-PV)

FRESHMAN YEAR

First Quarter				Second Quarter				Third Quarter			
BI	101	Prin. of Biology	5	BI	102	Plant Biology	5	BI	103	An. Biology	5
CH	103	Fund. Chem. I	4	CH	104	Fund. Chem. II	4	CH	105	Fund. Chem. II	4
CH	103L	Chem. Lab.	1	CH	104L	Chem. Lab.	1	CH	105L	Fund. Chem. Lab.	1
MH	160	Pre-Cal. w/Trig.	5	MH	161	An. Geom. & Cal.	5	MH	162	An. Geom. & Cal.	5
		Electives	2			Electives	2			Electives	2

SOPHOMORE YEAR

PS	205	Intr. Phys. & Lab. I	4	PS	206	Intr. Phys. & Lab. II	4	PS	207	Intr. Phys. & Lab. III	4
CH	207	Org. Chem.	4	CH	208	Org. Chem.	3	ADS	220	An. Biochem.	5
CH	207L	Org. Chem. Lab.	1	CH	208L	Org. Chem. Lab.	2	ADS	200	Intr. An. &	
EH	101	English Comp.	3	EH	102	English Comp.	3			Dairy Sci.	5
HY	101	World History	3	HY	102	World History	3	EH	103	English Comp.	3
		Elective	1			Elective	1			Elective	1

JUNIOR YEAR

HY	103	World History	3	ZY	303	Syst. & Evol.	5	ZY	521	Vert. Zoo. I	5
ZY	300	Genetics	5	ZY	501	Invert. Zoology	5	ZY	522	Vert. Zoo. II	5
ZY	306	Prin. of Ecol.	5	MB	300	Gen. Microbiol.	5	AEC	202	Ag. Econ. I	5
EHA	304	Tech. Writing	3	ADS	320	Feeds & Feeding	4	PO	209	American Govt.	5
EH	141	Med. Vocabulary	3								

In the event the first-year Veterinary School alternative is not followed, the following must be completed successfully to receive the B.S. degree in zoology.

SC	211	Public Speaking or		ZY	310	Cell Biology & Lab.	6
EH	390	Adv. Eng. Comp.	5	ZY	511	Gen. Parasitology	5
ZY	301	Comp. Anatomy	5	ZY	524	Gen. An. Physiol.	5
ZY	200	Gen. Entomol.	5			Botany electives*	10
						Group electives**	10

TOTAL — 210 QUARTER HOURS

*Acceptable are BY 306, 309, 506, 509, 513, 515, and 516.

**See Dean or Adviser for list of approved group electives.

Entomology (ENT)

FRESHMAN YEAR

First Quarter				Second Quarter				Third Quarter			
BI	101	Prin. Biology	5	BI	102	Plant Biology	5	BI	103	Animal Biology	5
CH	103	Fund. Chem. I	4	CH	104	Fund. Chem. II	4	MH	162	An. Geom. & Cal.	5
CH	103L	Gen. Chem. Lab.	1	CH	104L	Gen. Chem. Lab.	1	AEC	202	Ag. Econ. I	5
MH	160	Pre-Cal. w/Trig.	5	MH	161	An. Geom. & Cal.	5	HY	101	World History	3
		Elective	1			Elective	1			Elective	1

SOPHOMORE YEAR

PS	205	Intr. Phys. & Lab. I	4	PS	206	Intr. Phys. & Lab. II	4	PS	207	Intr. Phys. & Lab. III	4
ZY	300	Genetics	5	CH	207	Organic Chem.	4	CH	208	Organic Chem.	3
EH	101	English Comp.	3	CH	207L	Org. Chem. Lab.	1	CH	208L	Org. Chem. Lab.	2
HY	102	World History	3	EH	102	English Comp.	3	ZY	200	Gen. Entomol.	5
		Elective	1	HY	103	World History	3	EH	103	English Comp.	3
						Elective	1			Elective	1

JUNIOR YEAR

ZY	306	Prin. of Ecol.	5	ZY	303	Syst. & Evol.	5	ZY	510	Syst. Entomol.	5
EH	390	Adv. Comp. or		ZY	507	Gen. Ins. Morph.	5	ZY	310	Cell Biology	4
SC	211	Public Speaking	5			Electives	8	ZY	310L	Cell Biology Lab.	2
ZY	301	Comp. Anatomy	5							Electives	8
		Electives	3								

SENIOR YEAR

MB	300	Gen. Microbiol.	5	ZY	501	Invert. Zoology	5	BY	506	Syst. Botany	5
ZY	511	Gen. Parasitol.	5	ZY	524	An. Physiol.	5	ZY	405	Appl. Entomol.	5
ZY	521	Vert. Zoo. I or				Electives	8			Electives	8
ZY	522	Vert. Zoo. II	5								
		Electives	3								

TOTAL — 210 QUARTER HOURS

Electives must be approved by Adviser and will include at least 17 hours of humanities and social sciences and 21 hours of group electives selected from a list available from the Adviser or Dean. At least 5 hours of group electives must be selected from the following: BY 306, 309, 509, 513, 515 and 516.

Entomology Pre-Vet Option (ENPV)

FRESHMAN YEAR

First Quarter				Second Quarter				Third Quarter			
BI	101	Prin. Biology	5	BI	102	Plant Biology	5	BI	103	Animal Biology	5
CH	103	Fund. Chem. I	4	CH	104	Fund. Chem. II	4	CH	105	Fund. Chem. III	4
CH	103L	Gen. Chem. Lab.	1	CH	104L	Gen. Chem. Lab.	1	CH	105L	Gen. Chem. Lab.	1
MH	160	Pre-Cal. w/Trig.	5	MH	161	An. Geom. & Cal.	5	ADS	200	Intr. An. &	
		Elective	1			Elective	1			Dairy Sci.	5
										Electives	2

SOPHOMORE YEAR

HY	101	World History	3	HY	102	World History	3	HY	103	World History	3
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3
CH	207	Org. Chem.	4	PS	206	Intr. Phys. & Lab. II	4	PO	209	American Govt.	5
CH	207L	Org. Chem. Lab.	1	CH	208	Organic Chem.	3	PS	207	Intr. Phys. & Lab. III	4
PS	205	Intr. Phys. & Lab. I	4	CH	208L	Org. Chem. Lab.	2			Electives	2
		Electives	2	EH	141	Med. Vocabulary	3				
						Elective	1				

JUNIOR YEAR

ZY	300	Genetics	5	ZY	303	Syst. & Evol.	5	ZY	306	Prin. of Ecol.	5
MB	300	Gen. Microbiol.	5	ZY	507	Gen. Ins. Morph.	5	ZY	504	Med. Entomol.	5
EHA	304	Tech. Writing	3	AEC	202	Ag. Econ. I	5	ZY	510	Syst. Entomol.	5
ZY	200	Gen. Entomol.	5	ADS	220	An. Biochem.	5	ADS	320	Feeds & Feeding	4

In the event the first-year Veterinary School alternative is not followed, the following must be completed successfully to receive the B.S. degree in Entomology.

SC	211	Public Speaking or		ZY	511	Gen. Parasitology	5
EH	390	Adv. Eng. Comp.	5	ZY	521	Vert. Zoo. I or	
ZY	301	Comp. Anatomy	5	ZY	522	Vert. Zoo. II	5
ZY	310	Cell Biol. & Lab.	6	ZY	524	Gen. An. Physiol.	5
ZY	501	Invert. Zoology	5	BY	506	Syst. Botany	5
MH	162	An. Geom. & Cal.	5			Botany Elective*	5

TOTAL — 210 QUARTER HOURS

*Acceptable are BY 306, 309, 509, 513, 515 and 516.

Integrated Pest Management (IPM)

FRESHMAN YEAR

First Quarter				Second Quarter				Third Quarter			
BI	101	Prin. Biology	5	BI	102	Plant Biology	5	EH	101	English Comp.	3
CH	103	Fund. Chem. I	4	CH	104	Fund. Chem. II	4	BI	103	Animal Biology	5
CH	103L	Gen. Chem. Lab.	1	CH	104L	Gen. Chem. Lab.	1	AEC	202	Ag. Econ. I	5
MH	160	Pre-Cal. w/Trig.	5	MH	161	An. Geom. & Cal.	5	HY	101	World History	3
		Electives	2			Electives	2			Elective	1

SOPHOMORE YEAR

ZY	200	Gen. Entomol.	5	ZY	300	Genetics	5	AY	304	Gen. Soils	5
EH	102	English Comp.	3	CH	207	Organic Chem.	4	MB	300	Microbiology	5
HY	102	World History	3	CH	207L	Org. Chem. Lab.	1	CH	208	Organic Chem.	3
PS	200	Found. Physics	5	EH	102	English Comp.	3	CH	208L	Org. Chem. Lab	2
		Elective	1	HY	103	World History	3			Electives	2
						Elective	1				

JUNIOR YEAR

AY	312	Prin. Weed Sci.	5	AY	200	Crop. Production	5	ZY	405	Appl. Ent.	5
ZY	306	Prin. of Ecol.	5	BY	309	Plant Pathology	5	AEC	510	Agric. Bus. Mgt.	3
BY	306	Plant Physiology	5	EHA	415	Bus. Prof. Comm				Electives	10
AEC	210	Microcom. Appl.	3			or					
				SC	211	Public Spk	5				
						Electives	3				

SENIOR YEAR

BY	551	Fol. Harv. Store Dis	3	ZY	503	Toxicology	5	AY	502	Soil Fertility	5
ZY	406	Insect Pest Mgt	5	ZY	504	Med.-Vet Entomol	5	ZY	510	Syst. Ent.	5
AY	514	Herbicides	5			Electives	8	BY	522	Soil and Seed Dis	4
		Electives	5							Electives	4

TOTAL — 210 QUARTER HOURS

Elective courses must include at least 20 hours from the approved list of group electives and 15 hours selected from the approved list of Humanities and Social Sciences.

Wildlife Biology (WL)

FRESHMAN YEAR

First Quarter				Second Quarter				Third Quarter			
BI	101	Prin. Biology	5	BI	102	Plant Biology	5	BI	103	Animal Biology	5
CH	103	Fund. Chem. I	4	CH	104	Fund. Chem. II	4	MH	162	An. Geom. & Cal.	5
CH	103L	Gen. Chem. Lab.	1	CH	104L	Gen. Chem. Lab.	1	PS	200	Found. Phys.	5
MH	160	Pre-Cal. w/Trig.	5	MH	161	An. Geom. & Cal.	5			Elective	1
		Elective	1			Elective	1				

SOPHOMORE YEAR

CH	207	Organic Chem.	4	ZY	303	Syst. & Evol.	5	ZY	200	Gen. Entomol.	5
CH	207L	Org. Chem. Lab.	1	CH	208	Organic Chem.	3	ZY	306	Prin. of Ecol.	5
ZY	300	Genetics	5	CH	208L	Org. Chem. Lab.	2	EH	103	English Comp.	3
EH	101	English Comp.	3	EH	102	English Comp.	3	HY	103	World History	3
HY	101	World History	3	HY	102	World History	3			Elective	1
		Elective	1			Elective	1				

JUNIOR YEAR

BY	506	Syst. Botany	5	EH	390	Adv. Comp. or		BST	501	Biol. Stats.	5
ZY	328	Prin. Wildlife Mgmt.	4	SC	211	Public Speaking	5	BY	513	Plant Ecology	5
AEC	202	Ag. Econ. I	5	ZY	301	Compar. Anatomy	5			Electives	8
		Electives	4			Electives	8				
ZY	328L	Prin. Wildlife Lab.	1								

SENIOR YEAR

FY	520	Silviculture	5	ZY	501	Invert. Zoology	5	ZY	522	Vert. Zoo. II	5
ZY	521	Vert. Zoo.	5	ZY	528	Wildl. Biol.	4	ZY	524	An. Physiol.	5
ZY	531	Wildl. Hab. Anal.	3	ZY	528L	Wildl. Biol. Lab	2			Electives	8
		Electives	4			Electives	7				

TOTAL — 210 QUARTER HOURS

Electives must be approved by Adviser and will include at least 17 hours from the humanities and social sciences and 21 hours of group electives selected from a list available from the Adviser or Dean. These electives should be selected **carefully** because students are required to graduate with the minimum educational requirements necessary to be eligible for certification by The Wildlife Society as an Associate Wildlife Biologist.

Wildlife Biology Pre-Vet Option (WL-PV)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH	103	Fund. Chem. I	CH	104	Fund. Chem. II	CH	105	Fund. Chem. III
CH	103L	Gen. Chem. Lab.	CH	104L	Gen. Chem. Lab.	CH	105L	Gen. Chem. Lab.
MH	160	Pre-Cal. w/Trig.	MH	161	An. Geom. & Cal.	PS	205	Intr. Phys. & Lab. I
EH	101	English Comp.	EH	102	English Comp.	EH	103	English Comp.
HY	101	World History	HY	102	World History	HY	103	World History

SOPHOMORE YEAR

BI	101	Prin. Biology	BI	102	Plant Biology	BI	103	Animal Biology
PS	206	Intr. Phys. & Lab. II	CH	207	Organic Chem.	CH	208	Organic Chem.
ADS	200	Intr. An. &	CH	207L	Org. Chem. Lab.	CH	208L	Org. Chem. Lab.
		Dairy Sci.	ADS	220	An. Biochem.	ADS	320	Feeds & Feeding
EH	141	Med. Vocabulary	PS	207	Intr. Phys. & Lab. III			Electives

JUNIOR YEAR

ZY	306	Prin. of Ecol.	ZY	300	Genetics	ZY	522	Vert. Zoo. II
ZY	328	Prin. Wildl. Mgmt.	MB	300	Gen. Microbiol.	PO	209	Amer. Govt.
ZY	521	Vert. Zoo. I	ZY	528	Wildl. Biology	BY	506	Syst. Botany
EHA	304	Tech. Writing	AEC	202	Ag. Econ. I	BY	513	Plant Ecology

In the event the first-year Veterinary School alternative is not followed, the following courses must be completed successfully to earn the B.S. degree in Wildlife Management:

EH	390	Adv. Eng. Comp. or	ZY	301	Comp. Anatomy	ZY	524	Anim. Physiol.
SC	211	Public Speaking	ZY	303	Evol. & Syst.	ZY	531	Wildl. Hab. Anal.
MH	162	An. Geom. & Cal.	ZY	200	Gen. Entomol.	ZY	520	Silviculture
			ZY	501	Invert. Zoology			Group Electives*

TOTAL — 210 QUARTER HOURS

*See Dean or Adviser for list of approved group electives.

Note: The B.S. degree in Wildlife Management under this option does not guarantee that the student will qualify for certification as Associate Wildlife Biologist by the Wildlife Society. See Adviser for information on certification requirements.

Marine Biology (MRB)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI	101	Prin. of Biology	BI	102	Plant Biology	BI	103	Animal Biology
CH	103	Fund. Chem. I	CH	104	Fund. Chem. II	MH	162	An. Geom. & Cal.
CH	103L	Gen. Chem. Lab.	CH	104L	Gen. Chem. Lab.	PS	205	Intr. Phys. & Lab. I
MH	160	Pre-Cal. w/Trig.	MH	161	An. Geom. & Cal.			Elective
		Elective			Elective			

SOPHOMORE YEAR

PS	206	Intr. Phys. & Lab. II	PS	207	Intr. Phys. & Lab. III	CH	208	Organic Chem.
ZY	300	Genetics	CH	207	Organic Chem.	CH	208L	Org. Chem. Lab.
EH	101	English Comp.	CH	207L	Org. Chem. Lab.	ZY	306	Prin. of Ecol.
HY	101	World History	EH	102	English Comp.	EH	103	English Comp.
		Elective	HY	102	World History	HY	103	World History
					Elective			

JUNIOR YEAR*

GL	101	Intr. Geol. I	ZY	435	Gen. Oceanography	MB	300	Gen. Microbiol.
AEC	202	Ag. Econ. I	BST	215	Intr. Bio. Stat. or	ZY	511	Gen. Parasitol.
ZY	310	Cell Biology	CSE	204	Comp. Prog.	ZY	521	Vert. Zoo. I or
ZY	310L	Cell Biol. Lab.	GL	102	Intr. Geol. II	ZY	522	Vert. Zoo. II
		Electives	ZY	303	Syst. & Evol.			Electives

SENIOR YEAR*

SC	211	Public Spk. or	ZY	301	Comp. Anat.	BY	513	Plant. Ecol.**
EH	390	Adv. Comp.	ZY	501	Invert. Zoology	FL	123, 153, or 173,	French
ZY	524	An. Physiol.	BY	306	Fun. Plt. Phys.**			German, or Russian
FL	121, 151, or 171,	French	FL	122, 152, or 172,	French			Electives
		German or Russian			German or Russian			
		Electives						

SOPHOMORE YEAR

HY	Requirement*	3	MB	300	Gen. Microbiology	5	SC	202	Appl. Sp. Comm.	3	
AEC	202	Ag. Econ.	5	HY	Requirement*	3	HY		Requirement*	3	
ADS	220	An. Biochem. &		PS	200	Fund. of Physics or	5	AY	304	General Soils	5
		Nutrition	5	PS	205	Intr. to Physics	4			Elective	5
		Elective	3-5			Elective	3 or 4				

JUNIOR YEAR

54 hours to be arranged in consultation with adviser.

SENIOR YEAR

53 hours to be arranged in consultation with adviser.

TOTAL — 210 QUARTER HOURS

*World History 101-102-103 (3-3-3) or Technology and Civilization 204-205-206 (3-3-3) or World Literature (EH) 260-261-262 (3-3-3).

Additional Courses to be taken:

FAA	393	Fisheries Seminar	1	FAA	537	Fish. Bio.	3
AEC	501	Farm Mgt.	5	FAA	539	Fish. Bio. Lab.	2
AN	352	Tractor and Eng. Tech.	5			and/or	
FAA	515	Limnology	5	FAA	511	Intr. Aqua. and	5
FAA	516	Water Qual. Mgt. Aqua.	5	FAA	520, 521, 522	Aqua. Prod.	15
FAA	538	Ichthyology	5	ZY	306	Prin. of Ecol.	5

The remaining requirements will include a minimum of 15 hours selected from the humanities and social sciences and at least 35 hours of group electives selected from the list that is available in the offices of the adviser and Dean and must be approved by them.

Biological Sciences and Teacher Education

Students in the Biological Sciences curriculum with majors in either botanical or zoological sciences who wish also to prepare for certification as teachers in secondary schools may pursue the dual objective of completing the requirements for the B.S. degree in their particular Biological Sciences majors and the requirements of the Teacher Education Program.

Students who choose the dual objective program should declare this intent to their departmental advisers by the end of their sophomore year. Students pursuing the dual objective plan will be assigned an adviser in the School of Education who will advise them on all matters involving requirements for completing the Teacher Education Program. (See detailed discussion of admission and retention procedures for teacher education on page 113.)

Landscape And Ornamental Horticulture (OH)

The Landscape and Ornamental Horticulture curriculum provides professional and basic knowledge and develops basic skills in four areas: Florist Crop Production, Landscape Design, Nursery Crop Production, and Retail Flower Shop Management. By the end of their sophomore year students will choose one of these areas as their major option, and will schedule the courses prescribed for that option in the junior and senior years.

FRESHMAN YEAR**First Quarter**

BI	101	Prin. Biology	5
MH	160	Pre. Cal. w/Trig.	5
EH	101	English Comp.	3
HF	101	Intr. Hort.	3
		ROTC or Elective	1
		Elective	1

Second Quarter

BI	102	Plant Biology	5
CH	103	Fund. Chem. & Lab.*	5
EH	102	English Comp.	3
HY	101	World History	3
		ROTC or Elective	1
		Elective	1

Third Quarter

CH	104	Fund. Chem. & Lab.	5
MH	161	An. Geom. & Cal. or	
MH	151	Finite Math.	5
EH	103	English Comp.	3
HY	102	World History	3
		ROTC or Elective	1
		Elective	1

SOPHOMORE YEAR

AEC 210	Micro. Comptr. or	AEC 202	Ag. Economics I	5	CH 207	Organic Chem. &
BST 216	Intr. Bio. Comptr.	SY 201	Intr. to Sociology	5	Lab. or	
HF 224	Plant Propagation		ROTC or Elective	1	CH 203	Organic Chem.
SC 211	Public Speaking		Electives	5	HF 221	Landscape
HY 103	World History					Gardening
	ROTC or Elective					ROTC or Elective
						Electives

JUNIOR YEAR

54 hours in selected option to be arranged in consultation with adviser.

SENIOR YEAR

53 hours in selected option to be arranged in consultation with adviser.

TOTAL — 210 QUARTER HOURS

*Students not qualified to take CH 103 will take CH 101 in first quarter and will take CH 102 and CH 103L in their second quarter.

ADDITIONAL COURSES TO BE TAKEN BY ALL OPTIONS

AY 304	General Soils	5	BY 506	Systematic Botany	5
AY 502	Soil Fertility or AY 506 Fertilizers & Soil Testing	5	EH 390	Advanced Composition	5
BY 306	Plant Physiology	5	HF 323	Ghse, Environ. Control	5
BY 309	Plant Pathology	5	ZY 502	Economic Entomology	5

REQUIRED ELECTIVES FOR VARIOUS OPTIONS

Florist Crop Production

Objective: To train students in production, marketing and management of floricultural crops.

The following courses, with credit hours shown, are required: ACF 211-Prin. of Acc.-4, HF 225-Flower Arranging-3, HF 308-Vegetable Crops-5, HF 522-Floricultural Crop Prod.-5, HF 425-Flower Shop Management-5, MN 310-Prin. of Management-4, ZY 300-Genetics-5, MT 241-Business Law-4 or MT 255-Legal and Social Environment of Business-4.

Landscape Design

Objective: To train students in the principles and practices of Landscape Design.

The following courses, with credit hours shown, are required: LA 321-Basic LA Design-5, LA 322-Basic Landscape Architectural Design-5, HF 521-Care and Maint. Orn. Plants-5, MT 241-Business Law-4 or MT 255-Legal and Social Environment of Business-4, AY 315-Turfgrass Mgt.-5, HF 222-Trees-5, HF 223-Evergreen Shrubs and Vines-5, HF 321-Deciduous Shrubs and Vines-5; and five hours to be selected from the following areas: AN 350-Soil and Water Technology-5, HF 523-Nursery Mgt.-5, GL 101-Intr. Geology-5, AT 122-Fund.-5.

Nursery Crop Production

Objective: to train students in production, marketing, and management of nursery products.

The following courses with credit hours shown, are required: AY 315 Turfgrass Mgt.-5, HF 201-Orchard Management-5, HF 521-Care & Maint. Orn. Plants-5, HF 523-Nursery Mgt.-5, ZY 300-Genetics-5; ten hours to be selected from the following 3 courses: HF 222-Trees-5, HF 223-Evergreen Shrubs & Vines-5, HF 321-Deciduous Shrubs & Vines-5; and 4 hrs. to be selected from the following 3 courses: ACF 211-Prin. of Acct.-4, MT 241-Business Law-4, or MT 255-Legal and Social Environment of Business-4.

Retail Flower Shop Management

Objective: To train students to be managers of retail flower shop operations. Both art and business management are involved.

The following courses, with credit hours shown, are required: EC 202-Economics II-5 or AEC 206-Ag. Economics II-5, ACF 211-Prin. of Acct.-4, HF 225-Flower Arranging-3, HF 522-Floricultural Crop Prod.-5, HF 425-Flower Shop Management-5, MN 310-Prin. of Management-4, MT 241-Business Law-4 or MT 255-Legal and Social Environment of Business-4, MT 331-Prin. of Marketing-5, MT 333-Merchandising Management-5.

OTHER ELECTIVES

Additional electives to make a total of 210 hours in a given option are to be selected with the approval of the adviser and dean.

School of Architecture and Fine Arts

E. KEITH MCPHEETERS, *Dean*

WARREN D. HOCKMAN, *Assistant Dean*

THE SCHOOL OF ARCHITECTURE AND FINE ARTS includes the Departments of Architecture, Art, Building Science, Industrial Design, Music, and Theatre.

The Departments of Architecture, Building Science and Industrial Design offer undergraduate degree curricula in Architecture, Interior Design, Landscape Architecture, Building Science and Industrial Design. The objective of these programs is to educate professional practitioners in the many aspects of the designed physical environment.

The Departments of Art, Music, and Theatre offer professional curricula in those disciplines. These departments also cooperate with the School of Education in the education of teaching professionals. The objective of these programs is to develop creative and professionally knowledgeable practitioners and teachers in the performing and visual arts and to provide a foundation for continuing professional development.

Graduate degrees are offered in Art, Music, Industrial Design, and Community and Regional Planning. For details see the *Graduate School Bulletin*.

Department of Architecture

The Department of Architecture was established in 1907 and is the oldest in the South. Courses are offered leading to the professional degree Bachelor of Architecture, Bachelor of Landscape Architecture, Bachelor of Interior Design, and Master of Community Planning.

Admission

Acceptance for admission to the professional curricula in architecture, landscape architecture, community planning, and interior design, will be determined on the basis of an evaluation of the candidate's test scores and academic records. These standards are in addition to those General Admission Requirements of Auburn University.

Transfer

Transfer students from non-architectural programs will be required to begin the Design sequence at AR 101. Transfer students from accredited schools of Architecture will be required to present examples of their work for evaluation by the Design Co-ordinators Committee. The Committee will determine the level at which the student will enter the Design Sequence.

Design Course Standards and Policies

All design courses must be taken in sequence. Any student receiving a grade below "C" in AR 201, 202, or 203 shall be reviewed at the end of the second year for a decision on continuation in the design program. Any student in design above the second year level who receives a grade below "C" on the second attempt in a design course will be subject to being dropped from the program.

All required lower division (first and second year) course work must be completed prior to entry into the third year of design. Likewise, all required upper division (third and fourth year) course work must be completed prior to entry into the fifth year of design.

The department requires the equivalent of two summers of professional experience in architectural, engineering, construction or related fields as approved by the faculty prior to entry into the fifth year professional program. Student work will be retained by the Department for indefinite periods to be used for exhibition or for record and accreditation purposes. Return of work is at the discretion of the Department.

The Cooperative Education Program is also offered. For more information, refer to page 40. The Department also offers a one quarter study abroad program for qualified "B" average or above students.

Architecture

The Curriculum in Architecture prepares the student as a citizen and as a professional. Since the building industry is one of the three largest in the nation in terms of expenditure and employment, architects today must accept a concern for the improvement of the physical design of the environment and assume the leadership in evolving effective procedures toward this end. Architects must bring to their work technical knowledge, social insight, creative imagination, and individual integrity. Each student, therefore, must pursue a specific field of study in order to develop depth of knowledge from elective course work.

The Bachelor of Science (a non-professional degree) may be awarded upon successful completion of the first four years of the curriculum in Architecture with the special approval of the Department Head and the Dean. The Bachelor of Architecture (the professional degree) is awarded upon completion of the fifth or professional year. Highly qualified students may also elect to pursue concurrently the Master of Community Planning degree under a special dual degree program during the fifth year of study.

The Department is a member of the Association of Collegiate Schools of Architecture, and the curriculum in Architecture is accredited by the National Architectural Accrediting Board. The Architecture curriculum prepares the student for the office experience and the examination required by the registration laws to practice architecture as well as for examination by the National Council of Architectural Registration Boards.

The Department strongly recommends that during the summer employment in a professional office that the student participate in the Internship Development Program sponsored by NCARB and the AIA. Participation in this program after completing third year design permits internship credit for professional licensing.

Curriculum in Architecture (AR)

First Quarter			First Year			Third Quarter		
			Second Quarter					
AR	101	Design Fund. ....5	AR	102	Design Fund. ....5	AR	103	Design Fund. ....5
MH	160	Pre. Cal. w/Trig. ....5	MH	161	An. Geom. & Cal. ....5	AR	121	Comptrs in
EH	101	English Comp. ....3	EH	102	English Comp. ....3			Architecture ....3
HY		Elective* ....3	HY		Elective* ....3	EH	103	English Comp. ....3
		Elective ....1			Elective ....1	HY		Elective* ....3
								Elective ....3
			SECOND YEAR					
AR	201	Arch. Design ....5	AR	202	Arch. Design ....5	AR	203	Arch. Design ....5
PS	205	Intr. Physics I ....4	PS	206	Intr. Physics II ....4	PS	207	Intr. Physics III ....4
AR	261	Hist. & Theo. Arch. ....3	AR	262	Hist. & Theo. Arch. ....3	BSC	211	Mech. of Structures ....5
BSC	202	Matis. of Constr. ....5	BSC	204	Constr. Systems ....3	AR	263	Hist. & Theo. Arch. ....3
					Electives ....3			
			THIRD YEAR					
AR	301	Arch. Design ....5	AR	302	Arch. Design ....5	AR	303	Arch. Design ....5
BSC	311	Strgth. of Matl. ....5	BSC	314	Reinf. Concrete ....5	BSC	315	Applied Struc. ....5
BSC	351	Bldg. Energy ....3	BSC	352	Building Equip. I ....3	BSC	353	Building Equip. II ....3
AR	350	20th Century Arch. ....3			Elective ....6			Elective ....3
		Elective ....2						
			FOURTH YEAR					
AR	401	Arch. Design ....5	AR	402	Arch. Design ....5	AR	403	Arch. Design ....5
EH		English** ....3	EH	401	Lit. Analysis ....3	EH	402	Lit. Structure ....3
AR	474	Intr. Urb. Plan. ....3	AR	475	Urban Design ....3	AR		Seminar ....3
		Elective ....7			Seminar ....3			Elective ....3
					Elective ....3			Elective ....3

BACHELOR OF SCIENCE

TOTAL — 208 QUARTER HOURS

*History Electives shall follow a sequence and may be chosen from the following: World History (HY 101, 102, 103), or Technology and Civilization (HY 204, 205, 206) or History of World Art (AT 171, 172, 173).

See Bulletin for University elective requirements of general course work.

EH 253-255 or EH 260-262. One course only.

**Any English courses in Literature 200 or above.

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours of general electives. One seminar will be chosen from each of four of the following categories. Consult department for specific offerings in each category.

AR 451 Seminars in Methods and Process

AR 452 Seminars in Contemporary Issues

AR 453 Seminars in Interdisciplinary Studies

AR 456 Seminars in Historical Perspectives

AR 457 Seminars in Aspects of Design

AR 458 Seminars in Disciplines of Environmental Design

Architectural Professional Program

Architectural Design Option

FIFTH YEAR

Second Quarter

First Quarter			Third Quarter		
AR	465	Arch. Design8	AR	466	Arch. Design8
AR	471	Prof. Practice3	AR	499	Design Research2
		Elec. or AR Seminar . . .3		472	Prof. Practice3
AR		Seminar3			Elec. or AR Seminar . .3

BACHELOR OF ARCHITECTURE

TOTAL — 257 QUARTER HOURS

Interior Design

The curriculum in Interior Design seeks to prepare students to take their places as professional specialists in the design of interior space. As such, they expect to assume responsible roles among those who shape the physical environment. Their primary interests in the development of the interiors encompass the social, historical and technical implications of the development of interior space, surface and material.

Curriculum in Interior Design (ID)

FIRST YEAR

Second Quarter

Third Quarter

First Quarter			Third Quarter		
AR	101	Design Fund.5	AR	102	Design Fund.5
EH	101	English Comp.3	EH	102	English Comp.3
AT	171	Hist. World Art3	AT	172	Hist. World Art3
MH	140	College Algebra5	AT	173	Hist. World Art3
		Elective1	PG	211	Psychology5
					Elective1

SECOND YEAR

AR	201	Arch. Design5	AR	202	Arch. Design5
ID	215	Elements of I.D.5	ID	216	Elements of I.D.5
AR	261	Hist. & Theo. Arch. . .3	AR	262	Hist. & Theo. Arch. . .3
		Nat. Sci. Elective5			Nat. Sci. Elective5
			SY	201	Sociology5

THIRD YEAR

ID	305	Interior Design5	ID	306	Interior Design5
ID	365	Period Int.3	ID	366	Period Interiors3
AR	469	Lighting3	MN	310	Prin. Manag.***4
AR	350	20th Century Arch. . .3	BSC	204	Constru. Systems . . .3
		Elective3	EHA		304 Tech. Writing** . . .3
					Elective3

FOURTH YEAR											
ID	405	Interior Design	5	ID	406	Interior Design	5	ID	407	Int. Design (Thesis)	7
ID	441	Prof. Prac.	3	ID	408	Int. Design Res.	2			Elective	5
		Elective	5			Creative Crafts,				Elective	4
		Elective	5			Textile Design,					
						Weaving or					
						Photography	3				
				ID	442	Prof. Prac.	3				
						Elective	5				

BACHELOR OF INTERIOR DESIGN

TOTAL — 206 QUARTER HOURS

*MH 161 or ACF 215 Fund. of Gen. and Cost Accounting (5) or EE 202 or MN 207.

**EHA 304 or SC 202 Appl. Speech Comm. (3) or SC 211 Public Speaking (5).

MN 310 or EC 200 Economics I or MT 241 Business Law.

AT 371, 372, or 373, Art History may be substituted for AT 171, 172 or 173.

Two months of practical experience with a professional interior designer is recommended between the third and fourth year.

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours general electives.

Landscape Architecture

Landscape Architecture is the planning and design of land and water for optimum human use and enjoyment. In its growth, the profession has evolved to include a wide range of activities from a strong involvement with small scale physical design to the need for regional scale environmental analysis and natural resource planning.

Sound preparation for a career in Landscape Architecture requires a thorough professional education, therefore, the curriculum draws from the realms of Nature and Man, Art, and Technology for its strength. The curriculum addresses itself to the Landscape Architect's role in understanding and balancing the relationship between human enterprise and the natural environment.

The Bachelor of Science degree (a non-professional degree) may be awarded upon successful completion of the first four years of the curriculum in Landscape Architecture with the special approval of the Department and the Dean. The Bachelor of Landscape Architecture degree (the professional degree) is awarded upon the successful completion of the fifth year of study. *Highly qualified students may also elect to pursue concurrently the Master of Community Planning degree under a special dual degree program during the fifth year of study.* The total curriculum prepares the student for professional practice, as well as for the national and state registration examinations in landscape architecture.

Curriculum in Landscape Architecture (LA)

FIRST YEAR														
First Quarter					Second Quarter					Third Quarter				
AR	101	Design Fund.	5		AR	102	Design Fund.	5		AR	103	Design Fund.	5	
MH	160	Pre Cal. w/Trig.	5		MH	161	An. Geom. & Cal.*	5		BSC	324	Const. Survey	3	
EH	101	English Comp.	3		EH	102	English Comp.	3		EH	103	English Comp.	3	
BI	101	Prin. of Biology††††	5		BI	102	Plant Biology	5		GY	214	Phys. Geog.**	5	
												Elective	1	
SECOND YEAR														
AR	201	Arch. Design	5		AR	202	Arch. Design	5		AR	203	Arch. Design	5	
LA	231	Intr. Land. Arch.	3		LA	232	Dev. Land. Arch. I	3		LA	233	Dev. Land. Arch. II	3	
HY	101	World History***	3		HY	102	World History***	3		HF	321	Decid. Sh. & Vines	5	
HF	222	Trees	5		HF	223	Everg. Sh. & Vines	5		HY	103	World History***	3	
THIRD YEAR														
LA	321	Basic L.A. Design	5		LA	322	Basic L.A. Design	5		LA	323	Basic L.A. Design	5	
PS	205	Physics	4		LA	342	Lands. Const. II	5		LA	343	Lands. Const. III	5	
SY	201	Intr. Sociology†	5		EC	206	Socio-Economics	3		PG	211	Psychology††	5	
LA	341	Lands. Const. I	5				Elective	3		EHA	304	Tech. Writing†††	3	

FOURTH YEAR

First Quarter			Second Quarter			Third Quarter		
LA	421	Int. Lands. Design . . . 5	LA	422	Int. Lands. Design . . . 5	LA	423	Int. Lands. Design . . . 5
SC	211	Public Speaking . . . 5	LA	431	Adv. Plant. Comp. . . . 5	AN	350	Soil & Water Tech. . . 5
AR	474	Intr. Urb. Plng. . . . 3	AR	475	Urban Design 3	LA	455	Land Arch. Seminar . . 5
ZY	306	Prin. of Ecology 5			Elective 4			Elective 3

BACHELOR OF SCIENCE

TOTAL — 205 QUARTER HOURS

FIFTH YEAR								
LA	451	Adv. Lands. Design . . . 8	LA	452	Adv. Lands. Design . . . 8	LA	453	Adv. Lands. Design . . . 8
LA	446	Prof. Practice I 3	LA	447	Prof. Practice II 3			Elective 3
		Elective 3			Elective 5			Elective 3
LA	450	Design Research 2						

BACHELOR OF LANDSCAPE ARCHITECTURE

TOTAL — 253 QUARTER HOURS

*MH 161 or PA 305 or 370. Also PA 211 and PA 212.

**GY 214 or GL 102 or 110 or AY 310.

***HY 101, 102, 103, Technology and Civilization (HY 204, 205, 206), or ART (AT 171, 172, 173).

†SY 201 or Rural Sociology (RSY 261).

††PG 211 or 212 or 213.

†††EHA 304 or 315.

††††BI 101 or BI 105.

Department of Art

The Visual Arts curriculum educates students to become professional practitioners as graphic designers, illustrators, advertising artists, art directors, painters, sculptors, print-makers, etc. It leads to the Bachelor of Fine Arts degree, and its programs of studio courses is combined with studies of the function and historical background of the visual arts. Courses in general education promote in students a comprehension of their responsibilities to their society and culture. A structured program of fundamental courses precede advanced courses in which students work with a maximum of independence under the guidance of qualified instructors.

The Visual Arts curriculum may be divided into three general categories: academic courses, studio courses and courses in art history. Studio courses are divided into three progressive group levels. The first year is made up of visual art fundamentals. The second and third years contain classes in basic traditional media in which the student learns technical procedures and develops the disciplines necessary to express himself fully in the third and fourth year areas of concentration. The third and fourth year areas include drawing, painting, printmaking, sculpture, visual design and illustration.

The Visual Communications program gives fundamental training in the techniques of graphic design and related areas of visual communication. It is strongly reinforced with courses in painting, drawing, printmaking, sculpture and art history. Students preparing themselves as practicing artists or artist-teachers may concentrate entirely upon the offerings in the traditional fine arts media. Students planning to teach at the college level need to secure a Master of Fine Arts degree at this or another institution.

The department also offers a limited number of courses for education majors specializing in art, and for students in other fields who seek general knowledge and appreciation of the visual arts. Students in the School of Arts and Sciences may elect a minor (15 hours), a double minor (30 hours), or B.A. with art major (See page 82).

The Department of Art is an accredited member of the National Association of Schools of Art and Design, and a member of the College Art Association.

Transfer

All course work to be considered for transfer credit should be the equivalent of work required in the Visual Arts curriculum at Auburn. Art studio course credit earned (C or better) will be considered for advanced standing if a complete portfolio of work is submit-

ted to the Auburn Art Department for evaluation. If the examples do not approximate Auburn's requirements, then credit may be given for an art studio elective. If the quality of work is not acceptable, credit may be given for an open elective. **Transfer students are advised that their degree may require more than a total of four years because of the professional nature of Auburn's curriculum, the sequential arrangement of its courses, and heavy demands for enrollment.**

Graduate Study in Fine Arts

Students who hold the degree of Bachelor of Fine Arts, or a similar degree, are eligible to apply to the Dean of the Graduate School for admission to the graduate program leading to the Master of Fine Arts degree. For details examine the *Graduate School Bulletin*.

Curriculum in Visual Arts (VAT)

First Quarter			FIRST YEAR			Third Quarter		
			Second Quarter					
AT	111	Fundamentals5	AT	112	Fundamentals5	AT	113	Fundamentals5
AT	121	Fundamentals5	AT	122	Fundamentals5	AT	123	Fundamentals5
AT	171	Hist. of World Art3	AT	172	Hist. of World Art3	AT	173	Hist. of World Art3
EH	101	English Comp.3	EH	102	English Comp.3	EH	103	English Comp.3
			SECOND YEAR					
AT	211	Basic Fig. Dwg.5	AT	212	Fig. Const.5	AT	213	Fig. Drawing5
AT		Group A Studio5	AT		Group A Studio5	AT		Group A Studio5
		Natural Science5			Social Science5			Natural Science5
		Math/Philosophy3			Math/Philosophy3	AT		Art History3
			THIRD YEAR					
AT		Group A Studio5	AT		Group A Studio5	AT		Group B Studio5
AT		Group A Studio5	AT		Group A or B Studio5	AT		Group A or B Studio5
		Natural Science5			Nat. or Soc. Sci.5			Nat. or Soc. Sci.5
AT		Art History3	AT		Art History3			Elective3
			FOURTH YEAR					
AT		Group B Studio5	AT		Group B Studio5	AT	499	Terminal Project5
AT		Group A or B Studio5	AT		Group A or B Studio5	AT		Studio or AT HY5
AT		Studio or AT HY5	AT		Studio or AT HY5	AT		Studio or AT HY5
		Elective3			Elective3			Elective3

TOTAL — 210 QUARTER HOURS

Six hours of Basic and six hours of Advanced ROTC may be scheduled in lieu of 12 hours of general electives.

GROUP A STUDIO

Prerequisites: AT 113, 123, 171, 172, and 173 (or by special permission).

Figure Drawing			Visual Communications					
AT	211	Basic Figure Drawing	AT	221	Graphic Processes	AT	321	Photodesign
AT	212	Figure Construction	AT	222	Design Systems	AT	322	Photocommunication
AT	213	Figure Drawing	AT	223	Graphic Formats	AT	323	Typographics
Painting			Printmaking			Sculpture		
AT	231- 331	Oil Painting	AT	241- 341	Relief Printmaking	AT	251- 351	Clay Sculpture
AT	232- 332	Transp. Wtr. Color	AT	242- 342	Intaglio Printmaking	AT	252- 352	Wood Sculpture
AT	233- 333	Opaque Wtr. Color	AT	243- 343	Planographic Printmaking	AT	253- 353	Stone Sculpture

GROUP B STUDIO

Prerequisites: 18 hours of art history and the minimum averages listed below.

AT	424-425-426	Visual Design 1, 2, 3	2.0	Average in 200-level Drawing and Visual Comm.
AT	434-435-436	Advanced Painting/Drawing 1, 2, 3	2.0	Average in 200-level Drawing and Painting.
AT	444-445-446	Advanced Printmaking 1, 2, 3	2.0	Average in 200-level Drawing and Printmaking.
AT	454-455-456	Advanced Sculpture 1, 2, 3	2.0	Average in 200-level Drawing and Sculpture.
AT	464-465-466	Illustration 1, 2, 3	2.0	Average in 200-level Drawing and Visual Comm.

Department Of Building Science

The purpose of the curriculum in Building Science is to develop professionally knowledgeable practitioners and managers for a wide variety of roles in the construction industry.

The Department of Building Science offers courses in structural and mechanical systems for buildings, construction procedures, cost estimation and construction management. The curriculum leads to the degree of *Bachelor of Science in Building Construction*.

All new students will be classified as Pre-Building Science. To be changed to BSC classification he or she must complete all work shown in the first year model curriculum plus PS 205-6-7, have a 2.2 overall grade point average on all courses attempted at Auburn University, and have a minimum of 96 quarter hours of acceptable credits. PreBSC will not be allowed to take 300 and 400 level BSC courses. Non-majors will be seated on a space available basis.

Curriculum in Building Science (BSC)

First Quarter			FIRST YEAR			Third Quarter		
MH	160	Pre-Cal. w/Trig. ....5	MH	161	An. Geom. & Cal. ....5	MH	162	An. Geom. & Cal. **5
BSC	261	Hist. of Bldg. I ....3	BSC	262	Hist. of Bldg. II ....3	BSC	202	Matls. of Constr. ....5
EH	101	English Comp. ....3	EH	102	English Comp. ....3	EH	103	English Comp. ....3
HY	204	Tech. & Civil. *3	HY	205	Tech. & Civil. *3	HY	206	Tech. & Civil. *3
BSC	100	Drawing & Proj. ....2			Elective. ....3			
			SECOND YEAR					
EC	200	Gen. Economics ....5	ACF	211	Intr. Acct. ....4	BSC	211	Mech. of Struct. ....5
BSC	203	B.P. Rdg. & Wk. Dr. ....4	PS	208	Physics ....4	ACF	212	Intr. Acct. ....4
PS	205	Physics ....4	BSC	204	Constr. Systems ....3	PS	207	Physics ....4
		Hum.-Soc. Elec. ....5	SC	202	App. Speech Comm. ....3			Hum.-Soc. Elec. ....5
					Hum.-Soc. Elec. ....5			
			THIRD YEAR					
BSC	311	Strength of Mtls. ....5	BSC	314	Reinforced Concrete ....5	BSC	315	Appld. Struct. ....5
BSC	324	Constr. Surveying ....3	MN	500	Ind. Relations ....5	BSC	421	Constr. Estim. I ....4
BSC	340	Cn. Saf. & Hv. Eq. ....3	BSC	352	Bldg. Equip. I ....3	BSC	323	Fndatns. & Soils ....3
		Computer Elec. ....3	MT	255	Leg. Envir. of Bus. ....4	BSC	325	Formwk. Design ....3
		Elective. ....4			Tech. Elective ....2	BSC	353	Bldg. Equip. II ....3
			FOURTH YEAR					
BSC	431	Constr. Estim. II ....4	BSC	434	Constr. Schldg. ....5	BSC	490	Terminal Project ....8
BSC	405	Contracting Bus. I ....3	BSC	406	Contracting Bus. II ....3			Tech. Electives ....5
EHA	415	Writ. Bus. Comm. ....3	HED	494	First Aid ....3			
		Tech. Electives ....8			Tech. Electives ....6			

TOTAL — 207 QUARTER HOURS

*HY 101, 102, 103 may be substituted for HY 204, 205, 206.

**5 Qtr. hrs. Chemistry may be substituted for MH 162.

Hum.-Soc. and Technical Electives must be selected from lists approved by the Department. Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for SC 202, 7 hours of general electives, and two hours of technical electives.

Department of Industrial Design

Industrial Design is concerned primarily with the practical and aesthetic relation of products and systems to those who use them. The Industrial Designer is responsible for the product's shape, color, proportion, and texture, or for the optimum interaction between man and technology in a system. The professional is deeply concerned with such factors of use as efficiency, convenience, safety, comfort, maintenance, and cost.

The Industrial Designer's activity encompasses areas such as product design, transportation design, package design, exhibition design, and systems design.

Students of Industrial Design learn, for example, the basic principles of design, engineering, human factors designing, marketing, and sociology. They acquire such technical skills as drafting, model-making, photography and sketching techniques. Students are introduced to design methods, product planning, visual statistics, materials, manufacturing methods, consumer psychology, and environmental studies.

The four-year curriculum leads to the professional degree of Bachelor of Industrial Design. The program is approved by the Industrial Designers Society of America. Graduates will qualify for positions in industrial design consultant offices and in various industries.

A Cooperative Education Program is also offered. (See Cooperative Education section.)

Admissions

Students meeting the general admissions requirements of Auburn University will be admitted to the Industrial Design Department. Admission to sophomore design classes requires a 2.00 cumulative G.P.A. Transfer students from other design schools will be required to present examples of their work for evaluation to determine advanced placement. Students transferring from non-design programs will begin the design sequence at IND 210.

Design Course Standards and Policies

Design courses must be taken in sequence and may not be taken simultaneously with prerequisites. All courses in the freshman year of the curriculum must be completed prior to entering design courses in the junior year. Students that do not meet grade standards listed under industrial design course descriptions will be suspended from taking studio design courses for one year. Design courses may be retaken after a one year suspension to improve the student's scholastic record. Any student not meeting academic minimums on their second attempt will be subject to being dropped from the curriculum.

Curriculum in Industrial Design (IND)

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
MH	160	Pre. Cal w/Trig. ....5	MH	161	An. Geom. & Cal. ....5			
EH	101	English Comp. ....3	EH	102	English Comp. ....3	EH	103	English Comp. ....3
HY	204	Tech. & Civilization ....3	AT	111	Perspective Drawing ....5	HY	205	Tech. & Civilization ....3
IE	102	Graphic Comm. ....2	IE	107	Desr. Geometry ....2	IE	105	Engr. Drawing II ....2
		& Des. ....2	IE	111	Woodworking ....1	MN	207	Computer Prog. ....3
IND	101	Design Awareness ....2						
IE		Metalworking Elec. ....1						

			SOPHOMORE YEAR					
IND	210	Industrial Design ....6	IND	211	Industrial Design ....6	IND	212	Industrial Design ....6
IND	221	Materials & Tech. ....5	IND	222	Tech. Illustration ....5	IND	223	Ind. Des. Methods ....5
		Elective ....3	EC	202	Economics II ....5	PS	205	Intr. Physics ....4
PG	212	Psychology ....5			Elective ....3	IE	204	Kinematics of Mach. ....3

			JUNIOR YEAR					
IND	310	Industrial Design ....6	IND	311	Industrial Design ....6	IND	312	Industrial Design ....6
IND	309	Design Comm. ....5	IND	308	Design Workshop ....5	IND	307	Anthropometry ....5
EHA	304	Tech. Writing ....3	AT		Art History Elective ....3	MT	331	Prin. of Marketing ....5
		Elective ....3			Elective ....5			Elective ....3

			SENIOR YEAR					
IND	410	Industrial Design ....6	IND	411	Industrial Design ....6	IND	412	Ind. Design Thesis ....6
IND	415	Hy. of Ind. Design ....5	IND	420	Prof. Practice ....5	IND	585	Seminar in Ind. Des. ....5
		Elective ....5	PG	565	Psycho. Design ....5			Elective ....5

BACHELOR OF INDUSTRIAL DESIGN

TOTAL — 207 QUARTER HOURS

Electives must come from the list of courses approved by the Department.

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours of general electives.

Students who hold a bachelor's degree are eligible to apply to the Dean of the Graduate School for admission to the graduate program leading to the Master of Industrial Design degree. For details see the *Graduate School Bulletin*.

Department of Music

The Department of Music provides instruction and performing experience to students interested in developing their talents in music. The courses of study provided by the

Department have been created to present a balance between creative skills and academic studies, allowing at the same time a certain flexibility to meet individual requirements.

The Department of Music offers the Music major a professional curriculum leading to the Bachelor of Music degree, with majors (a) Performance, (b) Theory and Composition, (c) Church Music, or (d) Piano Pedagogy. These programs provide preparation for the professional field of performance and for private or college teaching of applied music, theory, and composition. They also provide training for church organists and choir directors.

Students pursuing the Bachelor of Music Education degree will register through the School of Education.

For the student wishing to major in Music History and Literature, the Department of Music offers a program of studies leading to the Bachelor of Arts degree. This is a cultural, not a professional, degree.

Private instruction is available to all University students in band and orchestral instruments, voice, piano, and organ. Performance groups, such as the Marching and Concert Bands, Orchestra, University Singers, Concert Choir, Choral Union, Opera Workshop, and various instrumental ensembles, are also available to students in all curricula.

In each curriculum option six hours of Basic and six hours of Advanced ROTC may be scheduled in lieu of 12 hours of general electives.

Professional Curriculum in Music (MU)

(A) Performance Major

FIRST YEAR		
First Quarter		
MU 131	Mat. & Org. Music	5
EH 101	English Comp.	3
HY 101	World History	3
MU 181	Performance (major)	3
MU 187	Performance (minor)	1
MU 100	Perform. Attnclce.	0
MU	Perf. Group	1
MU 251	Mu. Lit.	1
Second Quarter		
MU 132	Mat. & Org. Music	5
EH 102	English Comp.	3
HY 102	World History	3
MU 181	Performance (major)	3
MU 187	Performance (minor)	1
MU	Perf. Group	1
MU 100	Perform. Attnclce.	0
MU 252	Mu. Lit.	1
Third Quarter		
MU 133	Mat. & Org. Music	5
EH 103	English Comp.	3
HY 103	World History	3
MU 181	Performance (major)	3
MU 187	Performance (minor)	1
MU	Perf. Group	1
MU 100	Perform. Attnclce.	0
MU 253	Mu. Lit.	1

SECOND YEAR		
MU 231	Mat. & Org. Music	5
	Natural Science	5
MU 181	Performance (major)	3
MU 187	Performance (minor)	1
MU	Perf. Group	1
MU	Ensemble	1
MU 100	Perform. Attnclce.	0
MU 232	Mat. & Org. Music	5
	Natural Science	5
MU 181	Performance (major)	3
MU 187	Performance (minor)	1
MU	Perf. Group	1
MU	Ensemble	1
MU 100	Perform. Attnclce.	0
	Elective	3
MU 233	Mat. & Org. Music	5
MH 100	Mathematics	5
MU 181	Performance (major)	3
MU 187	Performance (minor)	1
MU	Perf. Group	1
MU	Ensemble	1
MU 100	Perform. Attnclce.	0
	Elective*	3

THIRD YEAR		
MU 331	Mat. & Org. Music	5
MU 361	Conducting	2
MU 351	Music History	3
MU 381	Performance (major)	3
MU	Ensemble	1
MU 100	Perform. Attnclce.	0
	Elective	3
MU 332	Mat. & Org. Music	5
PA 210	Philosophy	3
MU 352	Music History	3
MU 381	Performance (major)	3
MU	Ensemble	1
MU 100	Perform. Attnclce.	0
	Elective	3
MU 333	Mat. & Org. Music	5
PA 214	Philosophy	3
MU 353	Music History	3
MU 381	Performance (major)	3
MU 100	Perform. Attnclce.	0
	Elective	3

FOURTH YEAR		
FL	Foreign Language	5
MU 381	Performance (major)	3
MU 452	Voc. Lit. or	3
MU 454	Instmtl Lit.	3
MU	Ensemble	1
MU 100	Perform. Attnclce.	0
	Elective (Social or Nat. Sci.)	6
FL	Foreign Language	5
MU 381	Performance (major)	3
MU	Pedagogy	3
MU	Ensemble	1
MU 362	Conducting	2
MU 100	Perform. Attnclce.	0
	Elective	3
FL	Foreign Language	5
MU 381	Performance (major)	3
MU	Ensemble	1
MU 363	Conducting	2
MU 100	Perform. Attnclce.	0
	Elective	3

TOTAL — 206 QUARTER HOURS

*In lieu of this elective, Vocal Performance majors are to take FL 391 Lyric Diction.

(B) Theory and Composition Major

FIRST YEAR														
First Quarter					Second Quarter					Third Quarter				
MU	131	Mat. & Org. Music	...	5	MU	132	Mat. & Org. Music	...	5	MU	133	Mat. & Org. Music	...	5
EH	101	English Comp.	...	3	EH	102	English Comp.	...	3	EH	103	English Comp.	...	3
HY	101	World History	...	3	HY	102	World History	...	3	HY	103	World History	...	3
MU	184	Performance	...	1	MU	184	Performance	...	1	MU	184	Performance	...	1
MUT	116	Woodwind Instr.	...	1	MUT	117	Woodwind Instr.	...	1	MUT	118	Woodwind Instr.	...	1
MUT	110	String Instr.	...	1	MUT	111	String Instr.	...	1	MUT	112	String Instr.	...	1
MU	100	Perform. Attn'dce.	...	0	MU		Perf. Group	...	1	MU		Perf. Group	...	1
MU	251	Mu. Lit.	...	1	MU	100	Perform. Attn'dce.	...	0	MU	100	Perform. Attn'dce.	...	0
					MU	252	Mu. Lit.	...	1			Elective	...	3
										MU	253	Mu. Lit.	...	1
SECOND YEAR														
MU	231	Mat. & Org. Music	...	5	MU	232	Mat. & Org. Music	...	5	MU	233	Mat. & Org. Music	...	5
		Natural Science	...	5			Social Science	...	3	MH	100	Mathematics	...	5
MU	184	Performance	...	1	PG	212	Psychology	...	5	MU	184	Performance	...	1
MUT	113	Brass Instr.	...	1	MU	184	Performance	...	1	MUT	115	Brass Instr.	...	1
MU	107	Voice Class	...	1	MUT	114	Brass Instr.	...	1	MU	119	Percussion Instr.	...	1
		Social Science Elect.	...	3	MU	108	Voice Class	...	1	MU		Perf. Group	...	1
MU		Perf. Group	...	1	MU		Perf. Group	...	1	MU		Ensemble	...	1
MU		Ensemble	...	1	MU		Ensemble	...	1	MU	100	Perform. Attn'dce.	...	0
MU	100	Perform. Attn'dce.	...	0	MU	100	Perform. Attn'dce.	...	0					
THIRD YEAR														
MU	331	Mat. & Org. Music	...	5	MU	332	Mat. & Org. Music	...	5	MU	333	Mat. & Org. Music	...	5
MU	351	Music History	...	3	MU	352	Music History	...	3	MU	353	Music History	...	3
MU	337	Modern Harmony I	...	3	MU	338	Modern Harm. II	...	3	MU	339	Modern Harm. III	...	3
MU	384	Performance	...	1	MU	384	Performance	...	1	MU	384	Performance	...	1
MU		Perf. Group	...	1	MU		Perf. Group	...	1	MU		Perf. Group	...	1
MU	100	Perform. Attn'dce.	...	0	MU	100	Perform. Attn'dce.	...	0	MU	100	Perform. Attn'dce.	...	0
		Elective	...	3			Elective	...	3			Elective	...	3
MU	334	Mu. Comp.	...	1	MU	335	Mu. Comp.	...	1	MU	336	Mu. Comp.	...	1
FOURTH YEAR														
FL		Foreign Language	...	5	FL		Foreign Language	...	5	FL		Foreign Language	...	5
MU	434	Music Comp.	...	3	MU	435	Music Comp.	...	3	MU	436	Music Comp.	...	3
MU	384	Performance	...	1	MU	384	Performance	...	1	MU	384	Performance	...	1
MU	537	Orchestration	...	3	MU	445	Theory Pedagogy	...	3	MU		Perf. Group	...	1
MU		Perf. Group	...	1	MU	538	Orchestration	...	3	MU	100	Perform. Attn'dce.	...	0
MU	100	Perform. Attn'dce.	...	0	MU		Perf. Group	...	1			Elective	...	6
		Elective	...	3	MU	100	Perform. Attn'dce.	...	0	MU	539	Orchestration	...	3
		Elective (Social or					Elective	...	3					
		Nat. Science)	...	3										

TOTAL — 209 QUARTER HOURS

(C) Church Music Major

FIRST YEAR														
First Quarter					Second Quarter					Third Quarter				
MU	131	Mat. & Org. Music	...	5	MU	132	Mat. & Org. Music	...	5	MU	133	Mat. & Org. Music	...	5
EH	101	English Comp.	...	3	EH	102	English Comp.	...	3	EH	103	English Comp.	...	3
HY	101	World History	...	3	HY	102	World History	...	3	HY	103	World History	...	3
MU	181	Performance (major)	...	3	MU	181	Performance (major)	...	3	MU	181	Performance (major)	...	3
MU	187	Performance (minor)	...	1	MU	187	Performance (minor)	...	1	MU	187	Performance (minor)	...	1
MU		Ensemble	...	1	MU		Ensemble	...	1	MU		Ensemble	...	1
MU	100	Perform. Attn'dce.	...	0	MU	100	Perform. Attn'dce.	...	0	MU	100	Perform. Attn'dce.	...	0
MU	251	Mu. Lit.	...	1	MU	252	Mu. Lit.	...	1	MU	253	Mu. Lit.	...	1
SECOND YEAR														
		Natural Science	...	5			Natural Science	...	5	MU	100	Mathematics	...	5
MU	231	Mat. & Org. Music	...	5	MU	232	Mat. & Org. Music	...	5	MU	233	Mat. & Org. Music	...	5
MU	181	Performance (major)	...	3	MU	181	Performance (major)	...	3	MU	181	Performance (major)	...	3
MU	187	Performance (minor)	...	1	MU	187	Performance (minor)	...	1	MU	187	Performance (minor)	...	1
MU		Ensemble	...	1	MU		Ensemble	...	1	MU		Ensemble	...	1
		(or MU 211)	...	1			(or MU 212)	...	1	MU	100	Perform. Attn'dce.	...	0
MU	100	Perform. Attn'dce.	...	0	MU	100	Perform. Attn'dce.	...	0			Elective	...	3
		Elective	...	3			Elective	...	3					

THIRD YEAR

MU 331	Mat. & Org. Music	..5	MU 332	Mat. & Org. Music	..5	MU 333	Mat. & Org. Music	..5
PA 210	Philosophy	..3	PA 214	Philosophy	..3	MU 353	Music History	..3
MU 351	Music History	..3	MU 352	Music History	..3	MU 381	Performance (major)	..3
MU 381	Performance (major)	..3	MU 381	Performance (major)	..3	MU	Ensemble	..1
MU 312	Hymnology	..3	MU 311	Liturgies	..3	MU 100	Perform. Attndce.	..0
MU	Ensemble	..1	MU	Ensemble	..1		Elective	..6
MU 100	Perform. Attndce.	..0	MU 100	Perform. Attndce.	..0			

FOURTH YEAR

FL	Foreign Language	..5	FL	Foreign Language	..5	FL	Foreign Language	..5
MU 361	Conducting	..2	MU 415	Organ Lit. or		MU 416	Church Music	
MU 381	Performance (major)	..3		Vocal Pedagogy	..3		Seminar	..3
MU	Ensemble	..1	MU 381	Performance (major)	..3	MU 381	Performance (major)	..3
MU 100	Perform. Attndce.	..0	MU 362	Conducting	..2	MU 453	Choral Lit.	..3
	Elective (Social or		MU	Ensemble	..1	MU	Ensemble	..1
	Nat. Sci.)	..6	MU 100	Perform. Attndce.	..0	MU 100	Perform. Attndce.	..0
				Elective (Social or				
				Nat. Sci.)	..5			

TOTAL — 210 QUARTER HOURS

(D) Piano Pedagogy Major

First Quarter

EH 101	English Comp.	..3
HY 101	World History	..3
MU 131	Mat. & Org. Music	..5
MU 184	Performance (major)	..1
MU 100	Perform. Attndce.	..0
	Music Elective	..1
MU 251	Surv. Music Lit.	..1
MU 327	Piano Ensemble	..1
MU 187	Performance (minor)	..1

FIRST YEAR

Second Quarter

EH 102	English Comp.	..3
HY 102	World History	..3
MU 132	Mat. & Org. Music	..5
MU 184	Performance (major)	..1
MU 100	Perform. Attndce.	..0
	Music Elective	..1
MU 252	Surv. Music Lit.	..1
MU 327	Piano Ensemble	..1
MU 187	Performance (minor)	..1

Third Quarter

EH 103	English Comp.	..3
HY 103	World History	..3
MU 133	Mat. & Org. Music	..5
MU 184	Performance (major)	..1
MU 100	Perform. Attndce.	..0
	Music Elective	..1
MU 253	Surv. Music Lit.	..1
MU 327	Piano Ensemble	..1
MU 187	Performance (minor)	..1

SECOND YEAR

MU 231	Mat. & Org. Music	..5	MU 232	Mat. & Org. Music	..5	MU 233	Mat. & Org. Music	..5
	National Science	..5		Nat. Science	..5	MH 100	Mathematics	..5
MU 184	Performance (major)	..1	MU 184	Performance (major)	..1	MU 184	Performance (major)	..1
MU 187	Performance (minor)	..1	MU 187	Performance (minor)	..1	MU 187	Performance (minor)	..1
MU 327	Piano Ensemble	..1	MU 327	Piano Ensemble	..1	MU 327	Piano Ensemble	..1
MU 100	Perform. Attndce.	..0	MU 100	Perform. Attndce.	..0	MU 100	Perform. Attndce.	..0
	Elective	..3		Elective	..3		Elective	..3

THIRD YEAR

MU 331	Mat. & Org. Music	..5	MU 332	Mat. & Org. Music	..5	MU 333	Mat. & Org. Music	..5
MU 351	Music History	..3	MU 352	Music History	..3	MU 353	Music History	..3
PA 210	Philosophy	..3	PA 214	Philosophy	..3	MU 361	Conducting	..2
MU 384	Performance (major)	..1	MU 384	Performance (major)	..1	MU 384	Performance (major)	..1
MU 327	Piano Ensemble	..1	MU 327	Piano Ensemble	..1	MU 327	Piano Ensemble	..1
MU 457	Keyboard Lit.	..1	MU 458	Keyboard Lit.	..1	MU 459	Keyboard Lit.	..1
	Elective	..3		Elective	..3		Elective	..3
MU 100	Perform. Attndce.	..0	MU 100	Perform. Attndce.	..0	MU 100	Perform. Attndce.	..0

FOURTH YEAR

FL	Foreign Language	..5	FL	Foreign Language	..5	FL	Foreign Language	..5
MU 447	Piano Pedagogy	..3	MU 448	Piano Pedagogy	..3	MU 449	Piano Pedagogy	..3
MU 327	Piano Ensemble	..1	MU 327	Piano Ensemble	..1	MU 327	Piano Ensemble	..1
MU 384	Performance (major)	..1	MU 384	Performance (major)	..1	MU 384	Performance (major)	..1
	Soc. or Nat. Science	..3		Soc. or Nat. Science	..3		Elective	..3
MU 337	Modern Harmony	..3		Music Elective	..3		Music Elective	..3
MU 100	Perform. Attndce.	..0	MU 100	Perform. Attndce.	..0	MU 100	Perform. Attndce.	..0

TOTAL — 194 QUARTER HOURS

Bachelor of Arts

FIRST YEAR

First Quarter			Second Quarter			Third Quarter		
MU	131	Mat. & Org. Music5	MU	132	Mat. & Org. Music5	MU	133	Mat. & Org. Music5
EH	101	English Comp.3	EH	102	English Comp.3	MH	100	Mathematics5
HY	101	World History3	HY	102	World History3	EH	103	English Comp.3
MU	184	Performance1	PA	211	Philosophy1	HY	103	World History3
MU		Ensemble1	MU	184	Performance1	MU	184	Performance1
		Elective3	MU		Ensemble1	MU		Ensemble1
MU	100	Perform. Attndce.0	MU	100	Perform. Attndce.0	MU	100	Perform. Attndce.0

SECOND YEAR

MU	231	Mat. & Org. Music5	MU	232	Mat. & Org. Music5	MU	233	Mat. & Org. Music5
		Natural Science5			Natural Science5	EH	255	English Lit.3
EH	253	English Lit.3	EH	254	English Lit.3	MU	184	Performance1
MU	184	Performance1	MU	184	Performance1	MU		Ensemble1
MU		Ensemble1	MU		Ensemble1	AT	171	Art History3
MU	100	Perform. Attndce.0	MU	100	Perform. Attndce.0	MU	100	Perform. Attndce.0
MU	251	Surv. Mu. Lit.1	MU	252	Surv. Mu. Lit.1			Elective5
						MU	253	Surv. Mu. Lit.1

THIRD YEAR

MU	331	Mat. & Org. Music5	MU	332	Mat. & Org. Music5	MU	333	Mat. & Org. Music5
MU	351	Music History3	MU	352	Music History3	MU	353	Music History3
MU	384	Performance1	MU	384	Performance1	MU	384	Performance1
PA	212	Philosophy3	MU	100	Perform. Attndce.0	MU	100	Perform. Attndce.0
MU	100	Perform. Attndce.0			Academic Minor5			Academic Minor5
		Academic Minor*5			Elective (Social or Nat. Science)3			Elective (Social or Nat. Science)3

FOURTH YEAR

PG	211	Psychology3	FL		Foreign Language5	FL		Foreign Language5
MU	384	Performance1	MU	361	Conducting2	MU	384	Performance1
FL		Foreign Language5	MU	384	Performance1	MU	100	Perform. Attndce.0
MU	100	Perform. Attndce.0	MU	100	Perform. Attndce.0			Academic Minor5
		Academic Minor5			Academic Minor5			Elective (Social or Nat. Science)3
		Elective (Social or Nat. Science)3			Nat. Science)3			Nat. Science)3

TOTAL — 198 QUARTER HOURS

*A minor of 30 quarter hours elected from approved courses.

Keyboard proficiency is required for non-keyboard majors. In such cases three of the applied music credits will be taken in piano.

Supplementary Requirements for Bachelor of Music and Bachelor of Arts Degree Candidates

1. All Music Majors, Music Education Majors and Music Minors taking MU 100 are to attend 80% of the concerts and Wednesday afternoon convocations on the approved list compiled by the departmental office. This is on a pass/fail basis. The list of approved concert offerings is to be prepared by the departmental office each quarter and distributed to all students at the first convocation. A signed program is to be collected by a person designated by the departmental office. These are to be recorded by office personnel along with convocation attendance. Students failing attendance requirements at the end of a quarter of applied study are to be listed by the departmental office and their names are to be submitted to both the registrar and faculty to prevent them from registering for applied music until the requirements are made up by sufficient recital attendance. Absences may be excused only by the Head of the Music Department.

2. At the end of the Sophomore year a comprehensive examination will be given which must be passed before the student is admitted to the upper division music courses. Transfer students must complete this examination to receive junior standing.

3. A. Students electing the performance major will present a junior recital during the third year of study and a senior recital during the fourth year of study.

B. Students electing the Theory and Composition major will present an original composition in small form during the third year of study and an original composition in large form during the fourth year of study.

C. Students electing the History and Literature major will present a written thesis during the fourth year of study.

D. Students electing the Church Music major will present a senior recital during the fourth year of study. The major performance area must be in organ or voice; if one is an organ major, his minor must be voice; if one is a voice major, an organ minor is required unless his keyboard background is too weak, in which case the minor must be piano.

E. Students electing the Piano Pedagogy major will present a senior recital during the fourth year of study.

4. Credit in private instruction is based on the amount of practice, each credit hour requiring a minimum of five hours practice per week.

5. Students whose major performing medium is not piano or organ will elect piano as the minor instrument.
6. Participation in an approved music performing group is required each quarter, with or without credit. Participation in opera workshop is required of junior and senior voice majors.
7. All students taking private instruction will meet public performance requirements as designated by the faculty. (See Music Department special regulations regarding requirements for jury examinations and convocation performances.)

Music Education

Teacher Education: Admission to the Teacher Education Program of the School of Education is open to students registered in the School of Architecture and Fine Arts to the same extent that it is open to students registered in the School of Education. Upon completion of all requirements of both the Teacher Education Program and the professional curriculum in music, the Dean of the School of Education will recommend to the appropriate State Department of Education that a professional certificate be issued. It is considered desirable for students who wish to engage in junior high or high school teaching to identify this objective as soon as possible in their four-year undergraduate work. Such students will be advised by two advisers, a professional education adviser in the School of Education and an academic adviser in the Department of Music. The advisers will counsel in their respective areas.

Music Organizations

Several musical organizations, sponsored by the University and directed by the Department of Music, provide excellent training in group music. See section on musical groups in the student handbook, *Tiger Cub*. These activities, which are open to students of the University, may be taken with or without credit.

Graduate Work in Music

Admission to graduate work toward the Master of Music Degree requires a Bachelor's degree in music, music education, or the equivalent from this or another recognized institution. Admission to graduate study in the Music Department shall be in accordance with policies of the Graduate School. In addition, all candidates must take entrance examinations in music theory and history administered by members of a Departmental Screening Committee, demonstrate competency at the keyboard, and fulfill additional requirements as follows:

Instrumental Majors — Audition

Voice Majors — Audition and demonstration of satisfactory diction in Italian, French, and German.

Department of Theatre

The Department of Theatre provides instruction and production experience to students interested in developing their talents in the theatrical arts, whether as majors or non-majors. To permit students to explore their personal resources in theatre, a broad range of classroom, laboratory, and performance experiences is provided in acting, directing, scenic and lighting design, costume design, theatre technology, construction and crafts, theatre history, dramatic literature, theatre criticism, and theatre administration and management.

The Bachelor of Fine Arts degree is specifically for those students of outstanding talent who enter college with a firm idea of their professional goals or who discover them soon after entering undergraduate study. This major (TH) is for students seeking professional training and/or desiring an intensive program of theatre studies with a high degree of specialization in one of two areas of concentration; i.e., Theatre Performance or Theatre Design and Technology. Admission to advanced standing in the program involves an audition or presentation of portfolio with continued quarterly review. Final recommendation for graduation is made after the successful presentation of a recital and/or portfolio during the candidate's final quarter.

The Bachelor of Arts degree is designed for students seeking the broadest possible exposure in the study of theatre and drama within the liberal arts curriculum. It is for students who choose to emphasize theatre as a humanistic study and/or who wish to

specialize in theatre history/criticism and dramatic literature. The specific requirements for the major (GTH) in this program may be found in the Arts and Sciences section of this *Bulletin*.

A curriculum in theatre/business management through the General Business-Theatre Professional Option, an interdepartmental program between the Departments of Management and Theatre, is administered by the School of Business. This major (GBT) is for students who wish to pursue a career in professional theatre business management.

Students in the School of Arts and Sciences, in addition to a theatre major, may elect a minor (15 hours) or a double minor (30 hours). Those wishing to minor in Theatre should consult the department head for specific recommendations and the assignment of a minor adviser.

Professional Curriculum in Theatre (TH)

Theatre Performance Major

FIRST YEAR			SECOND YEAR			THIRD YEAR		
First Quarter			Second Quarter			Third Quarter		
TH	100	Theatre Convocation .0	TH	100	Theatre Convocation .0	TH	100	Theatre Convocation .0
TH	300	Theatre Laboratory .1-4	TH	300	Theatre Laboratory .1-4	TH	300	Theatre Laboratory .1-4
TH	101	Intr. to the Theatre .3	TH	200	Intr. Act. & Direct. .4	TH	261	Costume
TH	231	Theatre Technology I .4	TH	265	Stage Makeup .3	TH		Construction .4
EH	101	English Comp. .3	EH	102	English Comp. .3	EH	103	English Comp. .3
HY	101	World History .3	HY	102	World History .3	HY	103	World History .3
		Elective .1			Elective .1			Philosophy or Math .5
								Electives .1
SECOND YEAR			THIRD YEAR			FOURTH YEAR		
TH	100	Theatre Convocation .0	TH	100	Theatre Convocation .0	TH	100	Theatre Convocation .0
TH	300	Theatre Laboratory .1-4	TH	300	Theatre Laboratory .1-4	TH	300	Theatre Laboratory .1-4
TH	211	Acting: Fundamentals .4	TH	215	Stage Voice .3	TH	271	Play Analysis .4
TH	240	Theatrical Design .4			Natural Science .5	TH	212	Acting:
		Natural Science .5			Theatre Electives .4			Techniques .4
		Electives .4			Electives .5			Natural or Soc. Sci. .5
						TH	371	History of Theatre I .3
TH	100	Theatre Convocation .0	TH	100	Theatre Convocation .0	TH	100	Theatre Convocation .0
TH	300	Theatre Laboratory .1-4	TH	300	Theatre Laboratory .1-4	TH	300	Theatre Laboratory .1-4
TH	321	Directing I .4	TH	311	Acting:	TH	373	History of Theatre III .3
TH	372	History of Theatre II .3			Characterization .4			Natural or Soc. Sci. .5
		Natural or Soc. Sci. .5	TH		Natural or Soc. Sci. .5	TH	312	Acting: Scene Study .4
		Electives .5			Electives .8			Electives .5
TH	100	Theatre Convocation .0	TH	100	Theatre Convocation .0	TH	100	Theatre Convocation .0
TH	300	Theatre Laboratory .1-4	TH	300	Theatre Laboratory .1-4	TH	300	Theatre Laboratory .1-4
TH	413	Acting: Auditions .4			Theatre Electives .9			Theatre Electives .9
		Theatre Electives .5			Electives .8			Electives .6
		Electives .5						
TH	374	History of Theatre IV .3						

TOTAL — 206 QUARTER HOURS

Theatre Design & Technology Major

FIRST YEAR			SECOND YEAR			THIRD YEAR		
First Quarter			Second Quarter			Third Quarter		
TH	100	Theatre Convocation .0	TH	100	Theatre Convocation .0	TH	100	Theatre Convocation .0
TH	300	Theatre Laboratory .1-4	TH	300	Theatre Laboratory .1-4	TH	300	Theatre Laboratory .1-4
TH	101	Intr. to Theatre .3	TH	200	Intr. to Act. & Dir. .4	TH	261	Costume
TH	231	Theatre Technology I .4	TH	232	Theatre	TH		Construction .4
EH	101	English Comp. .3			Technology II .4	EH	103	English Comp. .3
AT	171	Art History I .3	EH	102	English Comp. .3	AT	173	Art History III .3
		Elective .1	AT	172	Art History II .3	PA	202	Ethics & Society .5
					Elective .1			

SECOND YEAR

TH 100 Theatre Convocation .0	TH 100 Theatre Convocation .0	TH 100 Theatre Convocation .0
TH 300 Theatre Laboratory .1-4	TH 300 Theatre Laboratory .1-4	TH 300 Theatre Laboratory .1-4
TH 240 Theatrical Design .4	TH 233 Drafting .4	TH 271 Play Analysis .4
TH 345 Rendering .4	TH 362 Costume History II .4	TH 371 History of Theatre I .3
TH 361 Costume History I .4	PHS 101 Intr. to Phys. Sc. .5	TH 365 Costume Design I .4
PHS 100 Intr. to Phys. Sc. .5	TH 351 Lighting Design .4	ANT 203 Intr. to Anthropology .5

THIRD YEAR

TH 100 Theatre Convocation .0	TH 100 Theatre Convocation .0	TH 100 Theatre Convocation .0
TH 300 Theatre Laboratory .1-4	TH 300 Theatre Laboratory .1-4	TH 300 Theatre Laboratory .1
TH 333 Scene Painting .4	TH 265 Stage Makeup .3	TH 332 Stage Carpentry .4
TH 366 Costume Design II .4	TH 341 Scene Design I .4	TH 342 Property Design .3
TH 372 History of Theatre II .3	Natural or Soc. Sci. .5	TH 373 History of Theatre III .3
Electives .6	Theatre Elective .4	TH 363 Adv. Cost. Const. I .4
		Elective .3

FOURTH YEAR

TH 100 Theatre Convocation .0	TH 100 Theatre Convocation .0	TH 100 Theatre Convocation .0
TH 300 Theatre Laboratory .1-4	TH 300 Theatre Laboratory .1-4	TH 300 Theatre Laboratory .1-4
TH 321 Directing I .4	TH 441 History of Design .4	TH 331 Adv. Theatre
TH 461 Adv. Cost. Const. II .4	Electives .12	Technology .4
Natural or Soc. Sci. .5		Natural or Soc. Sci. .5
TH 374 History of Theatre IV .3		Electives .8

TOTAL — 206 QUARTER HOURS





School of Arts and Sciences

EDWARD H. HOBBS, *Dean*

LESLIE CAINE CAMPBELL, *Associate Dean*

WILLIAM L. ALFORD, *Associate Dean*

JAMES W. DUNCAN, *Assistant to the Dean*

THE SCHOOL OF ARTS AND SCIENCES is the oldest and largest school in Auburn University. Three academic areas — humanities, physical sciences, and social sciences — are represented by the School's 16 departments — Chemistry; Communication Disorders; English; Foreign Languages; Geography; Geology; History; Journalism; Mathematics; Philosophy; Physics; Political Science; Psychology; Religion; Sociology, Anthropology, and Social Work; and Speech Communication.

In the School of Arts and Sciences a student can gain a broad general education and also acquire depth in the particular field in which he majors. This combination lays a strong foundation for post-baccalaureate specialization in graduate studies or professional schools. A further function of this school is to provide courses which are needed by students of all other instructional divisions of the University.

Undergraduate Degrees

Four-year bachelor's degree programs are offered in three areas:

1. The *General Curriculum* offers options in 24 major fields, with a wide choice of minors available both within the School of Arts and Sciences and in other schools of the University.

2. *Pre-professional Programs* are offered in pre-law, pre-dentistry, pre-medicine, pre-optometry, pre-occupational therapy, pre-physical therapy, pre-pharmacy, and pre-veterinary medicine.

3. *Special Curricula* are available in chemistry, chemistry with biochemistry option, criminal justice, criminology, foreign languages-international trade, geology, health administration, laboratory and medical technology, Latin American studies, mathematics, applied mathematics, physics, applied physics, public administration, public relations, Spanish and social work.

Embodied in these curricula are the requirements of the University-wide Liberal Education Program.

Graduate Degrees

Master of Arts degrees are offered in English, French, Spanish, history, political science, sociology, and speech communication. Master of Science degrees are offered in chemistry, communication disorders, geology, mathematics, physics, and psychology.

Three special degrees are offered: Master of French Studies, Master of Hispanic Studies, and Master of Communication Disorders. The School of Arts and Sciences participates in the offering of an interdisciplinary degree, Master of Arts in College Teaching.

Doctor of Philosophy degrees are offered in chemistry, English, history, mathematics, physics, and psychology. Degree programs are described in the *Graduate School Bulletin*.

Teacher Education Program

Through the Dual Objectives Program a student in the School of Arts and Sciences may prepare for a career as a secondary school teacher with a major in biological sciences, chemistry, economics, English, foreign language, general science, geography, history, journalism, mathematics, physics, political science, psychology, social science, speech communication, or sociology. See *Arts and Sciences Bulletin* for details.

Dual Degree Program in Engineering

This program provides for enrollment in the General Curriculum of the School of Arts and Sciences for approximately three academic years and in the School of Engineering for approximately two academic years.

The student must complete the basic requirements of the General Curriculum and the requirements for a major therein. The student is not required to complete the minors or take the usual number of hours of electives. Thus he may transfer to the School of Engineering after the end of his Junior Year. Following completion of the academic requirements for one of the 11 baccalaureate degrees in the School of Engineering, two degrees will be awarded: a degree in the Arts and Sciences major, either a bachelor of science or bachelor of arts depending upon major chosen, and a bachelor's degree in the designated Engineering field. See *Arts and Sciences Bulletin* for more information.

Curriculum in Materials Engineering

An interdisciplinary curriculum in materials engineering is administered by the Department of Mechanical Engineering in the School of Engineering. It is conducted cooperatively by academic departments of the schools of Engineering and Arts and Sciences through a faculty Materials Engineering Curriculum Committee. (See page 155).

Certificate in Aging Studies

The Certificate in Aging Studies is a multidisciplinary program designed for students interested in problems of aging persons which will give them a general competency in gerontology. The career-oriented option complements a student's major field of study and, upon completion of the 25 hours, leads to a Certificate in Aging Studies. The program is open to all students who choose to use their elective hours in this manner. Interested students should contact the Office of the Dean.

Russian and East-European Studies Program

A student enrolled in the General Curriculum and majoring in history (GHY), philosophy (GPA), or political science (GPO) may elect the Russian and East-European Studies Program. Upon completion of this program and earning a bachelor's degree, the achievement will be noted in the student's transcript.

Consult the Chairman of the Committee on Russian/East-European and Asian Studies regarding this option.

Latin American Studies Program

The student desiring to pursue interdisciplinary studies in the Latin American area may enroll in the Special Curriculum in Latin American Studies. Required are a major in either history (LAH), Spanish (LAF), or political science (LAP), and concentrations in both remaining disciplines. Consult with departmental or the dean's advisers for more information.

Cooperative Education Programs

Cooperative Education Programs which give students an opportunity to integrate their academic training with work experience are offered in art, biology, chemistry, criminal justice, journalism, mathematics, applied mathematics, physics, applied physics, political science, pre-law, psychology, sociology, and speech communication. Students alternate each quarter between school and a work assignment provided through the Director of the Cooperative Education Program.

Advisory Services for Students

The head of the department (or his designee) in which the student majors becomes the student's adviser and is charged with outlining the student's major and minor work. The Office of the Dean, however, provides counseling services to the student before he

declares a major. For pre-professional students, counseling on professional school admission tests, admissions requirements and other such matters is provided by special committees and advisers as listed in the *Arts and Sciences Bulletin*.

The University Honors Program

This program offers individual learning opportunities, the possibility of accelerated entry into a master's program, and participation in honors courses to entering freshmen with extraordinarily high academic aptitude. See page 12 of this bulletin for further information.

Office of Public Service and Research

K. J. WARD, *Director*
R. S. MONTJOY, *Assistant Director*
J. L. CANNON, *Training Coordinator*

The Office of Public Service and Research (OPSR) complements the instructional and research programs of Auburn's School of Arts and Sciences with the capability to respond positively to public sector needs. Organized to provide coordination and leadership, OPSR helps faculty and departments to develop, conduct and administer general extension activities and public policy research. This research is in the area of county and municipal government finance, energy conservation, evaluation and productivity. Training activities in budgeting, communication, administration, and management include programs for county government officials, housing authority personnel, municipal revenue personnel, hospital administrators, parks and recreation officials, various professional associations, and local, state, and federal agencies. Through practical and efficient research, training and evaluation services, OPSR connects the University and the public sector by contributing to the base of knowledge necessary for informed public policy decision-making.

The General Curriculum (GC)

The General Curriculum is designed to broaden the student intellectually through the humanities and the natural and social sciences. Twenty-four majors are available under this curriculum. (See pages 82-84.)

FRESHMAN YEAR					
First Quarter		Second Quarter		Third Quarter	
FL	Foreign Language*5	FL	Foreign Language*5	FL	Foreign Language*5
	Group Req. I3-5		Group Req. I3-5		Group Req. I3-5
EH	101 English Comp.3	EH	102 English Comp.3	EH	103 English Comp.3
HY	101 World History3	HY	102 World History3	HY	103 World History3
	ROTC or Elective1		ROTC or Elective1		ROTC or Elective1
SOPHOMORE YEAR					
PO	209 American Govt.5	PO	210 State & Local Govt.5	SY	201 Intr. Sociology5
GY	Geography**5		Elective3-5		Elective3-5
	Group Req. II5		Group Req. II5		Group Req. III3-5
EH	Literature***3	EH	Literature***3	EH	Literature***3
	ROTC or Elective1		ROTC or Elective1		ROTC or Elective1

*A foreign language through the first year sequence as a minimum. (See page 83).

**GY 102, World Geography, or a geography course approved by the department of the student's major.

***EH 253-254-255 or EH 260-261-262 or EH 270-271-272 or EH 250-251.

JUNIOR AND SENIOR YEARS

During the junior and senior years the student is to complete his major requirements of at least 35 hours, two minors of at least 15 hours each (or a double minor of at least 30 hours), and elective work to total 201 hours. In lieu of two minors or a double minor, the student may declare a second major (from the list of possible majors shown below under Bachelor of Arts; Bachelor of Science); or may declare two majors and also complete one or more minors. All major and minor courses are to be numbered 200 or above.

TOTAL — 201 QUARTER HOURS

GROUP REQUISITE I, Mathematics-Philosophy. One philosophy course (3-5) or one mathematics course (5). Any Auburn University philosophy course or comparable transfer credit in philosophy will fulfill the requirement. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of this Group Requisite as well. Group Requisite I may be completed in one quarter.

GROUP REQUISITE II, Science. A minimum of 10 hours in one science, including corresponding laboratories from the following: BI 101-102, 101-103, 105-106, 105-107, 105-108; CH 101-102-104, 103-104, GL 101-102, 110-103, PS 205-206-207, PS 220-221-222, or PHS 100-101.

GROUP REQUISITE III, Humanities-Social Sciences-Fine Arts. A course (3-5 hours) in art, economics (preferably 206), journalism (preferably 315), music, psychology, religion, speech communication, or theatre.

Majors and Minors in the General Curriculum

A student undecided about a major may delay declaring one until the end of the fifth quarter, but it is desirable to declare as soon as possible. Before a major is declared, the student will be in the General Curriculum (GC). Students should consult with their departmental advisers regularly to plan their major work, clear prerequisites, and take their major courses according to departmental schedule. A minimum of 35 hours is required in each major. All courses must normally be numbered 200 or above.

BACHELOR OF ARTS: Anthropology, Art, Comparative Literature, Earth Sciences, English, Foreign Language, History, Journalism, Philosophy, Political Science, Psychology, Religion, Social Work, Sociology, Speech Communication, and Theatre.

BACHELOR OF SCIENCE: Biology, Chemistry, Communication Disorders, Economics, Geography, Mathematics, and Physics.

Since some of the above majors require alignment of courses beginning in the freshman and sophomore years, it is important that the student be alert early in his college career to all of the requirements of his major.

MINORS: Because the student's major will affect his choice of minors it is very important that he consult with his major departmental adviser before selecting either two minors (minimum of 15 hours credit in each) or one double minor (minimum of 30 hours credit) from the following: anthropology, architecture, art, botany, chemistry, communication disorders, criminal justice, economics, English, foreign language, geography, geology, history, journalism, mathematics, music, philosophy, physical education, physics, political science, psychology, religion, sociology, speech communication, theatre, zoology, and additional approved subjects in the Schools of Agriculture, Business, Education, Engineering, or Home Economics. Minor courses must normally be numbered 200 or above. Selected courses at the 100-level are, however, included in art, music and theatre; for requirements in these fields, the student should see an adviser. A student cannot major and minor in the same field (except in foreign language, see page 83).

THE ANTHROPOLOGY MAJOR. Prerequisites: SY 201. The major will include ANT 203, SY 220, 370, ANT 303 or 403, plus an additional course in each of the four subdisciplines of anthropology: cultural, linguistic, archaeological and physical anthropology. With departmental permission a student may meet the distribution requirement with courses taught in other departments, but hours taken within the major must total 40.

THE ART MAJOR. Prerequisites: AT 111-112-113, and 121-122-123. The major will include AT 231, 232 or 333; 241, 242 or 343; 251, 252 or 353; and 371-372-373, plus 15 hours of art courses at the 200-level or above. (See also Curriculum in Visual Arts in the School of Architecture and Fine Arts.)

THE BIOLOGY MAJOR. A major in biology will take BI 101-102-103; CH 103-104, including labs, MH 140-161 or MH 160-161; and PS 205-206-207 among his requisites; and a 20-hour minor in chemistry (in lieu of the two 15-hour minors ordinarily required) which will include CH 207-208, including labs, CH 209, and CH 301 or CH 316 or CH 518. The major will include BY 300, 306, ZY 300, 301, 303, 306, 310; plus 20 hours of 500-level BY and ZY courses to be selected in consultation with the GBI adviser. (See also Special Curricula in Biological Sciences in the School of Agriculture.)

THE CHEMISTRY MAJOR. Prerequisites: CH 103-104-105 and labs (or 111-112-113), MH 160-161-162, PS 205-206 (or 220-221-222). The major will include CH 204-205, 207-208-209 and labs, plus ten hours of chemistry courses at the 300-level or above. (See also special curricula in Chemistry.)

THE COMMUNICATION DISORDERS MAJOR. The major will include audiology and speech pathology courses CD 340, 341, 350; the clinical sequence CD 455, 456; and the upper

level courses CD 551, 552, 553, 554, 560, and 562. Additional hours may be selected from related areas, upon approval of adviser.

THE COMPARATIVE LITERATURE MAJOR. Prerequisites: EH 260-261-262. The major will include 25 hours chosen from: EH 312, 340, 353, 571, 573, 574, 575, FL 371, 372, and 373, plus ten hours of 300-level or above in English Literature courses or in the literature of a second foreign language if the student can demonstrate proficiency in that language. The student will double minor in one foreign language including five 3-hour courses at the 300-level or above. In special cases the Comparative Literature Committee may accept a minor in another field in place of the Foreign Language Minor. (See also the English/Comparative Literature option in the School of Education, Department of Secondary Education.)

THE EARTH SCIENCES MAJOR. Prerequisites: MH 161, CH 103-104-105 (or three approved courses in biology, botany and/or zoology), GL 103 and 110. The major will include GL 215, 240, plus 20 hours of geology courses at the 200-level or above, plus four 15-hour sequences in other departments subject to approval by the student's advisory committee. Two of these sequences will fulfill the requirements for minors. (See also Special Curriculum in Geology.)

THE ECONOMICS MAJOR. Prerequisites: EC 200 and 202. The major will include EC 551, 554, and 556; plus 20 hours of economics courses at the 300-level or above. EC 206 cannot count toward the major. (See also Curriculum in Economics in the School of Business.)

THE ENGLISH MAJOR. Prerequisites: EH 253-254-255 (or, if qualified, EH 250-251). All majors will take a course in Chaucer, Shakespeare, or Milton; a course in English literature; a course in American literature; and EH 390. Beyond this common core (20 hrs.), majors may elect, with adviser's approval, 20 hours of courses from Categories II through VI. These latter 20 hours may constitute a general English major, or a concentration in one of several different areas of English. Interested students should contact the department for help in pursuing the various Major options.

THE FOREIGN LANGUAGE MAJOR. Prerequisites: 15 hours of first-year level course work in the chosen language. The major will include 35 hours of courses at the 200-level or above in the chosen language. Spanish majors will choose two courses from FL 431-432-433 and one course from FL 434-435. The student may have a major in one language and a single minor in one other. In this case the student may count toward the bachelor's degree, beyond the 80-hour limit, the number of hours received through advanced placement to a maximum of 15. For advanced placement see page 28. (See also Special Curriculum in Foreign Language — International trade.)

THE GEOGRAPHY MAJOR. Prerequisites: GY 102, 214, 215, EHA 304, either SY 220, IE 220 or MN 274. The major will include GY 400, 440, plus 20 or more hours of geography courses at the 300-level or above, including at least one regional geography course.

THE HISTORY MAJOR. Prerequisites: HY 101-102-103. The major will include either HY 201-202 or 207-208 plus at least 30 additional hours, at least 15 of which must be at the 500 level. The student should consult the History Department each quarter of his junior and senior years regarding completion of his major and minor fields.

THE JOURNALISM MAJOR. Prerequisites: EH 101-102-103, JM 101. The major will include JM 221 (should be scheduled during the sophomore year), 222, 313, 314, 321, 322, 323, 421, 465, 485, and 422-423 or 425. A minimum of 48 hours is required for this major. (See also different journalism major in the Special Curriculum in Public Relations.)

THE MATHEMATICS MAJOR. Prerequisites: MH 161-162-163. The major will include MH 264, 265 or 269, 266 or 337, 331, 520, and four additional approved upper-division mathematics courses selected according to one of three plans. *Plan I*, which is oriented toward theoretical mathematics and preparation for graduate school, will include MH 332, 521, and two additional courses. *Plan II*, which provides preparation for a career in applied mathematics, will include MH 560, 567, and 561 or 568, and one additional course. *Plan III*, which is oriented toward discrete mathematics and mathematical computer science, will include three courses chosen from MH 339, 512, 515, 516, 571, 573, 575, and 577, plus one additional course. In order to graduate with a major in mathematics, a student must have an overall C average or better in all mathematics courses attempted which are required for the major, above the 100-level, and for which a grade other than W has been assigned. A minor in mathematics will not include courses numbered in the 280's or 580's. (See also Special Curricula in Mathematics and in Applied Mathematics.)

THE MICROBIOLOGY MAJOR. Prerequisites: BI 101-102-103, CH 103-104 including Labs, MH 160-161, CH 207-208 and labs, and PS 205-206-207. The major will include BY 300, 400, 446, 503, 540, 543, CH 518, 519, ZY 300, and a minimum of 6 additional hours of microbiology courses.

THE PHILOSOPHY MAJOR. Prerequisites: PA 211 (or 370 in rare cases with approval), 202, or 214; and any other 200-level course, preferably 210. The major will include 333 (or 470 or 475 with approval); 334 (or 482, 484, or 590 with approval), 335 (or 380, 402, 432, 513, 580, or 591 with approval); plus 20 hours of philosophy courses at the 300-level or above, at least 15 of which should be 400-500 level. Prerequisites for the minor are 111, or 211 (or 370 in rare cases with approval); 202 or 214; and any other 200-level course; plus any 15 hours at or above the 300-level.

THE PHYSICS MAJOR. MH 161-162-163, 264, 269 and IE 204. The ten-hour natural science requirement must be met with either chemistry, biology or geology courses (with labs). The major will include PS 220, 221, 222, 300, 301, 302, 303, 305, 306 and nine additional credit hours in upper level physics courses. The minor will consist of PS 220, 221, 222 and 305. (See also Special Curricula in Physics and Applied Physics.)

THE POLITICAL SCIENCE MAJOR. Prerequisites: MH 140 or 160 or 161; PO 209 and 210. The major requires 40 hours of political science in addition to PO 209 and 210. Its introductory series (15 hours) consists of PO 300, 302, and one course from PO 309, 312 or 325. Its advanced series consists of 15 hours (no fewer than 10 of which shall be lecture courses and no fewer than 5 of which shall be at the 500-level) in one of five fields — American Government, Comparative Politics, International Relations, Political Theory and Public Administration — for which the introductory course has been taken (PO 209 and 210 are the introductory courses for American Government. PO 300 and 302 are the introductory courses for Political Theory.) Ten additional hours of political science electives shall be taken to complete the major. Ten hours of the 40 hours for the major must be at the 400 or 500-level. For graduation a student must have an overall C average in PO courses counted toward the major and no grades below C are accepted for transfer credit.

THE PSYCHOLOGY MAJOR. The major will include PG 211, 314, 315, 320, and at least one other course of experimental psychology, (PG 321, 322, 330) and four psychology courses at the 400-500-level. A minimum of 41 hours is required for this major.

THE RELIGION MAJOR. Prerequisite: RL 201. The major requires 40 hours in religion courses including 301, and ten hours from RL 210, 220, 230; 25 hours must be at the 300-level or above.

THE SOCIAL WORK MAJOR. Prerequisites: SY 201. The social work major will include SW 375, 376, SY 304 or 520, 220, and 370; followed by SW 320, 380, 506, 507, 508, 575, 520. The ten hour natural science requirement will be met with BI 105-106. Group Requisite III will be completed with one economics course. Elective hours will be partially filled with PG 211 and one additional psychology course. Two fifteen hour minors are required. Formal application to the social work program is required prior to registration in SW 506, usually in the junior year. An information packet describing the program, options available, and admission procedure is available in Haley Center 6080. Graduation requires completion of all required Sociology and Social Work courses with a grade of C or better. (See also special curricula in Spanish-Social Work, and Social Work-Child Welfare, and the pre-professional curriculum in Pre-Law).

THE SOCIOLOGY MAJOR. Prerequisites: SY 201. The major requires ANT 203, SY 220, 409 or 502, 370 or RSY 370 plus 20 additional hours, which may include an additional ANT course and additional courses in criminology. (See also Special Curriculum in Criminology.) Sociology majors may minor in ANT or social work. Descriptive brochures are available in Departmental Office.

THE SPEECH COMMUNICATION MAJOR. The major will include two courses chosen from SC 200, 301, 350; one course chosen from SC 211, 273, 320, 378; three courses at the 500-level, plus 20 additional hours. A minimum of 45 hours is required for this major. See *different* speech major in the Special Curriculum in Public Relations.

THE THEATRE MAJOR. The following core courses are required: TH 101, TH 211, TH 231, TH 240, TH 261, TH 265, TH 271, TH 321, TH 371-372-373. In addition, theatre majors are required to enroll in TH 100 and TH 300 during every quarter of residency. The balance of elective theatre hours should be selected in consultation with the student's theatre faculty adviser. A minimum of 70 hours is required for the Theatre Major.

THE WOMEN'S STUDIES MINOR. A single minor, 15 hours, interdisciplinary. Students may choose from the following courses to complete this minor: ANT 524, EH 383, FCD 568, FL 427, HY 390, PG 420, SW 320. Students should plan the minor in consultation with their faculty advisers, integrating it with their particular academic and career interests.

Symbols for Majors

The first letter in each symbol identifies the curriculum; the last two letters indicate the major.

Majors	General Curriculum	Pre-Law	Pre-Dentistry	Pre-Medicine	Pre-Optometry	Pre-Vet. Med.
Undeclared	GC	PL	PD	PM	OP	PV
Anthropology	GAN					
Art	GAT					
Biology	GBI	LBI	DBI	MBI	OBI	VBI
Chemistry	GCH	LCH	DCH	MCH	OCH	VCH
Communication Disorders	GCD	LCD	DCD	MCD	OCD	VCD
Comparative Lit.	GCL	LCL	DCL	MCL	OCL	VCL
Criminal Justice		LCJ				
Earth Sciences	GGE	LGE	DGE	MGE	OGE	VGE
Economics	GEC	LEC	DEC	MEC	OEC	VEC
English	GEH	LEH	DEH	MEH	OEH	VEH
Foreign Lang.	GFL	LFL	DFL	MFL	OFL	VFL
Geography	GGY	LGY	DGY	MGY	OGY	VGY
History	GHY	LHY	DHY	MHY	OHY	VHY
Journalism	GJM	LJM	DJM	MJM	OJM	VJM
Mathematics	GMH	LMH	DMH	MMH	OMH	VMH
Microbiology	GMB		DMB	MMB		
Philosophy	GPA	LPA	DPA	MPA	OPA	VPA
Physics	GPS	LPS	DPS	MPS	OPS	VPS
Political Science	GPO	LPO	DPO	MPO	OPPO	VPO
Psychology	GPG	LPG	DPG	MPG	OPG	VPG
Religion	GRL	LRL	DRL	MRL	ORL	VRL
Social Work	GSW	LSW				
Sociology	GSY	LSY	DSY	MSY	OSY	VSY
Speech Comm.	GSC	LSC	DSC	MSC	OSC	VSC
Theatre	GTH					

Symbols for Special and Some Pre-Professional Curricula

Applied Mathematics	AMH	Lab Technology	LT
Applied Physics	APS	Medical Technology	MDT
Chemistry	CH	Mathematics	MH
Criminal Justice—Law Enforcement	CJL	Pre-Dental Hygiene	DH
Criminal Justice—Offender Rehab.	CJO	Pre-Occupational Therapy	OT
Criminal Justice—Youth Services	CJY	Pre-Pharmacy	PPY
Criminal Justice and Spanish	CJF	Public Relations—Journalism	PRJ
Criminology	SCR	Public Relations—Speech Commun.	PRS
Foreign Language—International Trade	FLT	Physics	PS
Geology	GL	Pre-Physical Therapy	PT
Health Administration	HA	Public Administration	PUB
Health Services	HSA	Social Work—Child Welfare	CSW
Health Systems	HSM	Spanish-Social Work	FSW
Latin American Studies—			
History	LAH		
Political Science	LAP		
Spanish	LAF		

Pre-Professional Curricula

Pre-professional programs are offered in pre-law, pre-dentistry, pre-medicine, pre-optometry, pre-occupational therapy, pre-physical therapy, pre-pharmacy, and pre-veterinary medicine. Advisers are available in each curriculum to guide the students concerning admissions requirements to the professional schools. The department in which students major will advise them in their major work. Completion of these curricula does not assure admission to a professional school. Competition for admission to professional schools is keen; the number of qualified applicants exceeds the number of places available.

Curriculum in Pre-Law (PL)

This curriculum, which is administered by the Department of Political Science, is designed to prepare students for accredited professional law schools, most of which require for admission a bachelor's degree, a good scholastic record, and a good score on the national Law School Admission Test (LSAT). The pre-law student should take the LSAT at least nine months ahead of the date he expects to enter law school.

FRESHMAN AND SOPHOMORE YEARS

The student will follow the General Curriculum and will take EC 200.

JUNIOR AND SENIOR YEARS

During the junior and senior years, the pre-law student will complete major requirements of at least 35 hours, two minors of at least 15 hours each, or a double minor of at least 30 hours, and additional work to total 201 hours. In lieu of two minors or a double minor, the student may declare a second major, or may declare two majors and also complete one or more minors. He/she will take EC 202; EH 390; PG 211; ACF 215; HY 306; HY 571 or 527; PO 501 or 502; and SC 202 or 211 in the major, minor, requisites, or electives. Recommended in addition to these are SC 378 and an additional course in political science, or PG 435.

TOTAL — 201 QUARTER HOURS

Majors in the Pre-Law Curriculum

BACHELOR OF SCIENCE: Biology, Chemistry, Communication Disorders, Economics, Geography, Mathematics, and Physics.

BACHELOR OF ARTS: English, Comparative Literature, Criminal Justice, Earth Sciences, Foreign Language, History, Journalism, Philosophy, Political Science, Psychology, Religion, Sociology, Social Work, and Speech Communication. In addition to the foregoing majors from the General Curriculum, the following major is available in the Pre-Law curriculum:

THE CRIMINAL JUSTICE MAJOR. Prerequisite: LE 260. The major requires 35 hours in law enforcement courses and HED 597, PG 301, PO 502, and SCR 302. One of the two minor requirements will be in political science or criminology. (See also Special Curriculum in Criminal Justice-Law Enforcement/Offender Rehabilitation.)

A student, upon selection of a major, should check requirements and utilize Group Requisites I, II and III as much as possible to clear lower level requisites during the freshman and sophomore years. (See Symbols for Majors on page 85.)

Students may take no more than 25 percent of degree requirements in courses offered by the School of Business.

Curriculum in Pre-Dentistry (PD), and Pre-Medicine (PM)

This curriculum leads to a Bachelor of Science degree and is designed to prepare students for medical and dental schools. The requirements are very exacting and demand high scholastic competence and performance. Students must strive for a B-plus four-year college record to attain good promise of being selected by a professional school.

The bachelor's degree is required by most dental and medical schools for admission; however, should outstanding students gain admission to a dental or medical schools prior to graduation, they may receive a combination B.S. degree by completing successfully the first nine quarters of this curriculum, including the special requirements listed under the Junior and Senior years below, a total of 157 quarter hours, and the freshman year of professional school.

Students in pre-dentistry or pre-medicine should take the national Dental Aptitude Test or the Medical College Admission Test at least a year in advance of the date of entry to professional school, and follow with an application to the professional schools of their choice. Early in the junior year, the student should seek information from the Premedical-Pre-dental Advisory Committee concerning procedures to follow to obtain the necessary committee evaluation and recommendation to professional school. Forms and instructions are available in the office of the Dean of Arts and Sciences.

Clinical Preceptorship. The Department of Mathematics participates with the Institute of Medicine and Mathematics of Ohio University, whereby certain pre-medical students who have a strong concentration of work in mathematics (about 50 credit hours) may upon recommendation of the Department of Mathematics be awarded clinical preceptorships which may enhance their acceptance at a medical college. Interested students should contact the head of the department for further information.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH	111	General Chemistry . . . 5	CH	112	General Chemistry . . . 5	CH	113	General Chemistry . . . 5
MH	161	An. Geom. & Cal. . . . 5	MH	162	An. Geom. & Cal. . . . 5	MH	163	An. Geom. & Cal. . . . 5
EH	101	English Comp. 3	EH	102	English Comp. 3	EH	103	English Comp. 3
HY	101	World History 3	HY	102	World History 3	HY	103	World History 3
		ROTC or Elective 1			ROTC or Elective 1			ROTC or Elective 1

SOPHOMORE YEAR

BI	101	Prin. Biol. & Lab. . . . 5 ✓	BI	103	Animal Biol. & Lab. . . 5 ✓	ZY	310	Cell Biology & Lab. . . 6 ✓
CH	207	Organic Chem. 5 ✓	CH	208	Organic Chem. 5 ✓	CH	209	Organic Chemistry & Lab. 5 ✓
PS	205	Intr. Physics 4	PS	206	Intr. Physics 4	PS	207	Modern Physics 4
EH		Literature** 3	EH		Literature** 3	EH		Literature** 3
		ROTC or Elective 1			ROTC or Elective 1			ROTC or Elective 1

*Students may substitute a course in statistics for MH 163.

**EH 253-254-255 or EH 260-261-262 or EH 270-271-272 or EH 250-251.

The student should declare a major by the end of the sixth quarter.

JUNIOR AND SENIOR YEARS

During the junior and senior years students will complete the following special requirements: (a) EH 390, PG 211, 212, PO 209, SY 201, an additional PO or SY course, ZY 300, 302, one 200-level philosophy course, preferably PA 218 and (b) the requirements of their major which are to be selected from those listed under Symbols for Majors on page 85. Some recommended courses are ANT 203, 206, 207, AT 122, BI 102, BY 215, BY 300, BY 542, 543, CH 205, 316, 507, 508, 518, 519, 520, EC 200, 202, EH 141, FL through the first two quarters of the first year sequence as a minimum (see page 83), GL 101, 102, HY 306, GY 214, 215, CSE 204, MH 264, 265, PG 315, RL (200-level), SC 211, SY 202, ZY 301, 519, 520, 524, 560, 561, and/or 300-400-500 level courses in anthropology, English, geography, history, philosophy, political science, psychology, religion, and sociology.

TOTAL — 209 QUARTER HOURS

Students should become acquainted with the requirements for their major (see page 82) to begin as early as possible the alignment of courses required.

Curricula in Pre-Dental Hygiene (DH), Pre-Occupational Therapy (OT) and Pre-Physical Therapy (PT)

These curricula are designed to prepare students for admission to professional schools. The student should strive for a good college record to attain reasonable promise of being selected.

Students should write for official bulletins from the professional schools of their choice early in their freshman year and discuss with their adviser any special requirements of those particular schools. Official application for admission to the professional schools needs to be made about a year in advance of the expected date of matriculation.

Pre-Dental Hygiene (DH)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI	101	Prin. Biol. & Lab. . . . 5	ZY	250	Human Anatomy 5	ZY	251	Physiology 5
CH	103	Fund. Chem. & Lab. . . . 5	CH	104	Fund. Chem. & Lab. . . . 5	CH	203	Organic Chemistry . . . 5
HY	101	World History 3	HY	102	World History 3	PG	211	Psychology 5
EH	101	English Comp. 3	EH	102	English Comp. 3	EH	103	English Comp. 3

SOPHOMORE YEAR

PG	212	Dev. Psychology 5	SY	201	Intr. Sociology 5	FED	350	Cult. Found. Edu. . . . 5
FED	213	Human Development . . 5	BY	300	Gen. Microbiology . . . 5	SY	204	Social Behavior 5
NF	318	Nutri. Biochem. 5	FED	300	Edu. Psychology 5			Group Requisite 3
HY	103	World History 3			Group Requisite 3	SC	211	Public Speaking 5

TOTAL — 104 QUARTER HOURS

GROUP REQUISITE. A minimum of six hours in history, music, literature or art.

Pre-Occupational Therapy (OT)

First Quarter			FRESHMAN YEAR			Third Quarter		
BI	101	Prin. Biol. & Lab.5	ZY	250	Human Anatomy5	PO	209	American Govt.5
PG	211	Psychology5			Group Req. I5	ZY	251	Physiology5
EH	101	English Comp.3	EH	102	English Comp.3	EH	103	English Comp.3
		ROTC or Elective1			ROTC or Elective1			Elective3
								ROTC or Elective1
			SOPHOMORE YEAR					
SY	201	Intr. Sociology5	SY	202	Social Problems5	SY	220	Statistics5
SC	211	Public Speaking5			Group Req. II5			Group Req. III4-5
PG	212	Psychology5			Group Req. III5			Elective3-5
EH	260	Literature3	EH	261	Literature3	EH	262	Literature3
		ROTC or Elective1			ROTC or Elective1			ROTC or Elective1

TOTAL — 102 QUARTER HOURS

GROUP REQUISITE I. A course in mathematics, biology, chemistry, or physics.

GROUP REQUISITE II. AT 112 or 121.

GROUP REQUISITE III. An approved course in psychology.

RECOMMENDED ELECTIVES. ANT 203, CH 103-104 and labs., RA 282, 386, 485, PA 218, PS 200, SY 204, 312, SCR 302.

Students who continue beyond the sophomore year should select courses from alternate group requisites and recommended electives listed above, subject to additional specific requirements of the chosen professional schools. Also recommended are one or more 200-level courses in philosophy and other courses in the humanities and social sciences.

Pre-Physical Therapy (PT)

At the present time ten schools including the University of Alabama require a baccalaureate degree for entry into physical therapy at the master's level. By 1990 all education for the professional physical therapist will be post bachelor of science. Students applying to schools of physical therapy at the masters level or certificate level should complete requirements (a), (b), and (c) listed in the last paragraph of this curriculum model.

First Quarter			FRESHMAN YEAR			Third Quarter		
CH	103	Fund. Chem. & Lab.5	CH	104	Fund. Chem. & Lab.5	PG	211	Psychology5
		Group Requisite I5	MH	161	An. Geom. & Cal.5	SY	201	Intr. Sociology5
EH	101	English Comp.3	EH	102	English Comp.3	EH	103	English Comp.3
		Group Requisite II3			Group Requisite II3			Group Requisite II3
			SOPHOMORE YEAR					
BI	101	Prin. Biol. & Lab.5	BI	103	Animal Biol. & Lab.5	PO	209	American Govt.5
PG	212	Psychology5	PG	315	Quant. Methods5	SC	211	Public Spkg.5
PS	205	Intr. Physics4	PS	206	Intr. Physics4			Elective1-5
		Group Requisite III3			Group Requisite III3			Group Requisite III3

TOTAL — 102 QUARTER HOURS

GROUP REQUISITE I. MH 140 or MH 160.

GROUP REQUISITE II. A total of nine hours to complete the history requirement.

GROUP REQUISITE III. EH 253-254-255 or EH 260-261-262 or EH 270-271-272 or EH 250-251.

Students who continue beyond the sophomore year should take (a) PS 207, ZY 250, 251, 301, CH 203, an approved course in psychology, (b) requirements of his major, (c) electives to complete degree requirements of 201 hours selected from courses in the sciences, humanities and social sciences, subject to additional specific requirements of the chosen professional schools.

Curriculum in Pre-Optometry (OP)

This curriculum leads to a Bachelor of Science degree and is designed to prepare students for the rigorous demands of American optometry schools. The requirements are exacting and demand high scholastic competence and performance. Students must strive for a B-plus four-year college record to attain good promise of being selected by a professional school.

Students with outstanding records who are able to gain admission to an accredited school of optometry before graduation may qualify for the combination B.S. degree by one of the following methods: (1) completing successfully the first nine quarters of this curriculum, a total of 152 quarter hours, plus the freshman year of professional optometry school; or (2) completing successfully the first two years of this curriculum, a total of 107 quarter hours, plus three years of professional optometry school.

Pre-Optometry students should write for an official bulletin from each of the professional schools of their choice during the freshman year, and discuss with the *Pre-Optometry Adviser* any special requirements of those particular schools. The requirements of all the U.S. schools of optometry are covered in the suggested program below, either as required subjects or as electives. The student should take the Optometry College Admission Test and make official application for admission to the professional schools about a year in advance of the expected date of matriculation.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH	111	General Chemistry5	CH	112	General Chemistry5	CH	113	General Chemistry5
MH	180	Pre-Cal. w/Trig.5	MH	161	An. Geom. & Cal.5			Group Requisite5
EH	101	English Comp.3	EH	102	English Comp.3	EH	103	English Comp.3
BI	101	Prin. Biol. & Lab.5	BI	103	Animal Biol. & Lab.5	ZY	310	Cell Biology6

SOPHOMORE YEAR

HY	101	World History3	HY	102	World History3	HY	103	World History3
CH	207	Organic Chem. & Lab.5	CH	208	Organic Chem. & Lab.5			Group Requisite5
PS	205	Intr. Physics4	PS	206	Intr. Physics4	PG	315	Quant. Methods5
PG	211	Psychology5	PG	212	Psychology5	PS	207	Intr. Physics4

Students must declare a major by the end of their sixth quarter.

JUNIOR AND SENIOR YEARS

During the junior and senior years the student will complete the following: (a) EH 253, 254, 255 or EH 260, 261, 262 or EH 250, 251; PO 209; (b) requirements of his major; (c) electives to complete the degree requirements of 201 hours. Recommended electives are: BI 102, BY 215, 300, CH 209, EC 200, 202, FL through the first two quarters of the first year sequence as a minimum; CSE 204, MH 162, 163, PO 210, PG 330, SC 211, SY 201, 202, ZY 251, 300, 301, 302, and/or 300-level or above courses in English, history, philosophy, political science, psychology, and sociology.

TOTAL — 201 QUARTER HOURS

GROUP REQUISITES: A minimum of ten hours in social and behavioral science (PG, SY, EC, ANT, HY, PO).

Students should become acquainted with the requirements for their major to begin as early as possible the alignment of courses.

Curriculum in Pre-Pharmacy (PPY)

This curriculum meets the requirements for admission to the Auburn University School of Pharmacy, which is fully accredited by the American Council on Pharmaceutical Education. Complete information about the professional curriculum in pharmacy may be found on page 183.

To be considered for admission the applicant must complete the basic 2-year requirements below and must have a 2.00 (C) grade point average based on all courses attempted as well as a 2.00 (C) science index (grade point average on the biological and physical science courses and mathematics). A grade of "D" on any required course will not be accepted. A student who does not qualify for admission to the School of Pharmacy after completion of eight quarters in pre-pharmacy at Auburn University but who meets University continuation in residence requirements may continue to register in pre-pharmacy only by special permission of the Deans of Pharmacy and Arts and Sciences.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH	111	General Chemistry5	CH	112	General Chemistry5	CH	113	General Chemistry5
MH	180	Pre-Cal. w/Trig.5	MH	161	An. Geom. & Cal.5	BI	101	Prin. Biol. & Lab.5
EH	101	English Comp.3	EH	102	English Comp.3	EH	103	English Comp.3
HY	101	World History3	HY	102	World History3	HY	103	World History3
						PCS	261	Pharm. Hist. & Orient.3

SOPHOMORE YEAR

CH	207	Organic Chem. & Lab.5	CH	208	Organic Chem. & Lab.5	SY	201	Intr. Sociology5
ZY	250	Human Anatomy5	PS	206	Intr. Physics4	PS	207	Intr. Physics4
PS	205	Intr. Physics4	EC	202	Economics II5			Electives**8
MN	207	Intr. Comp. Prog.3			Humanities Elect.*3			

* Elective credit from the areas of English, foreign languages, journalism, art, music, theatre, history, philosophy, or religion.

** Elective credit is restricted to courses offered by the Departments of Philosophy and Psychology with no less than one course in each area.

TOTAL — 102 QUARTER HOURS

Curriculum in Pre-Veterinary Medicine (PV)

It is preferable to complete this curriculum and earn a baccalaureate degree, although it is possible to gain admission to the School of Veterinary Medicine upon completion of the minimum requirements listed below. The content of the chosen major is the same as in the General Curriculum (see page 81). A student must declare a major by the end of his/her fifth quarter. Upon successful completion of the four-year curriculum, a Bachelor of Science degree will be awarded. If a student is admitted to the School of Veterinary Medicine prior to completion of the full four years, he/she may obtain a Bachelor of Science degree by successfully completing the first nine quarters of this curriculum plus successfully completing the freshman year of the School of Veterinary Medicine.

The student will be guided by the *Pre-Veterinary Medicine Adviser* regarding this curriculum and by an adviser in the department of his/her major regarding the major subject.

The *minimum* requirements for admission to the School of Veterinary Medicine, Auburn University (127 quarter hours) are as follows (and are also incorporated in the curriculum model below):

EH 101-102-103 9	MH 160-161 10	ADS 200 5	PO 209 5
EH 141 3	BI 101-102-103 15	ADS 220 5	Humanities
HY 101-102-103 9	CH 103-104-105 15	ADS 320 4	Fine Arts
	CH 207-208 10	BY 300 5	and Social
	PS 205-206-207 12	ZY 300 5	Sciences 15

APPLICATION FOR ADMISSION to the School of Veterinary Medicine must be submitted to the Dean of that school between September 15 and October 15 preceding the admission date. A minimum grade point average of 2.50 is required for application; D grades in required academic courses are not acceptable. All minimum course requirements, including courses repeated because of time limitations, must be completed by the end of the spring quarter preceding the date of admission, and all advanced required courses in physical and biological science categories (organic chemistry, physics, microbiology, and genetics) must have been completed within six calendar years prior to the anticipated entrance date. Completion of this curriculum does not guarantee admission to a professional school of veterinary medicine. Competition for admission to the professional schools is keen with the number of qualified applicants exceeding the number of places available. (For further information, see School of Veterinary Medicine in this *Bulletin*.)

See also Pre-Veterinary Medicine option, School of Agriculture and Biological Sciences.

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
CH 103	Fund. Chem. & Lab.	5	CH 104	Fund. Chem. & Lab.	5	CH 105	Fund. Chem. & Lab.	5
MH 160	Pre-Cal. w/Trig.	5	MH 161	An. Geom. & Cal.	5	PS 205	Intr. Physics	4
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
			SOPHOMORE YEAR					
BI 101	Prin. Biol. & Lab.	5	PS 207	Physics	4	BI 103	Animal Biol. & Lab.	5
PS 206	Intr. Physics	4	CH 207	Org. Chem. & Lab.	5	CH 208	Organic Chem. & Lab.	5
ADS 200	Intr. Animal & Dairy Science	5	ADS 220	Anim. Biochem. & Nut.	5	PO 209	American Govt.	5
EH 141	Medical Vocabulary	3		Group Requisite I*	3		Group Requisite I	3
			JUNIOR YEAR					
BY 300	Gen. Microbiology	5	ZY 300	Genetics	5	ADS 320	Feeds and Feeding	4
	Major	5		Major	5		Major	5
BI 102	Plant Biology	5		Elective	3		Elective	5
	Group Requisite I	3		Group Requisite I	3		Group Requisite I	3
			SENIOR YEAR					
	Major	5		Major	5		Major	5
	Major	5		Major	5		Major	5
	Elective	5		Elective	5		Elective	5

*GROUP REQUISITE I. These requisites must be earned in humanities, fine arts, and social sciences.

TOTAL — 201 QUARTER HOURS

Special Curricula

Special curricula leading to the Bachelor of Science degree include chemistry, chemistry with biochemistry option, criminal justice, criminology, geology, health administration, laboratory and medical technology, mathematics, applied mathematics, physics, applied

physics, and public administration. The Bachelor of Arts degree may be earned in the Special Curriculum in Foreign Languages-International Trade, the Special Curriculum in Public Relations, the Special Curriculum in Latin American Studies, and the Special Curriculum in Spanish and Social Work.

Curriculum in Chemistry (CH)

This American Chemical Society accredited curriculum prepares students for careers in both pure and applied chemistry with a dual emphasis on classroom and laboratory experience. A flexible senior year allows students to tailor the program to their individual professional goals. Graduates will be prepared to enter the profession immediately or continue for advanced degree programs. The senior research program is designed to introduce students to modern advanced techniques and approaches to chemical research in an area of their interests by doing an individual research project in conjunction with a faculty adviser.

FRESHMAN YEAR											
First Quarter				Second Quarter				Third Quarter			
CH	111	General Chem.	4	CH	112	General Chem.	4	CH	113	General Chem.	4
CH	111L	Gen. Chem. Lab.	1	CH	112L	Gen. Chem. Lab.	1	CH	113L	Gen. Chem. Lab.	1
MH	161	An. Geom. & Cal.	5	MH	162	An. Geom. & Cal.	5	MH	163	An. Geom. & Cal.	5
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3
HY	101	World History	3	HY	102	World History	3	HY	103	World History	3
		ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1

SOPHOMORE YEAR											
CH	205	An. Chem. & Lab.	5	CH	304	Organic Chem.	5	CH	305	Organic Chem.	5
CH	303	Organic Chem.	5			Group Requisite	5			Approved Elective	3-5
MH	264	An. Geom. & Cal.	5	PS	220	Gen. Physics II	4	PS	221	Gen. Physics II	4
		Approved Elective	3	MH	265	Lin. Diff. Equations ...	3	MH	266	Topics Linear Algebra ...	3
						ROTC or Elective	1			Elective	1

JUNIOR YEAR											
CH	507	Physical Chemistry . . .	5	CH	508	Physical Chemistry . . .	5	CH	509	Physical Chemistry . . .	5
FL		German**	5	CH	513	Analytical Chem.	5	FL		German**	5
PS	222	Gen. Physics III	4	FL		German**	5	PS	305	Modern Physics	5
		Approved Elective***	3			Approved Elective	3			Approved Elective	3

SENIOR YEAR

Students will work out with their departmental advisers a program of study to meet their personal professional goals. Included in this program will be: CH 510 — Intermediate Inorganic Chemistry — 5; CH 490 — Special Problems in Chemistry — 5; and 15 credit hours selected from the following courses:

CH 504 Intr. to Molec. Orbital Methods	5	CH 516 Polymer Tech. II	3
CH 511 Inter. Inorganic Chem. II	5	CH 518 Biochemistry	5
CH 512 Chem. Thermody.	5	CH 519 Biochemistry	5
CH 515 Polymer Tech. I	4	CH 520 Clin. Biochemistry	5

Additional technical and general electives will be selected to complete 205 credit hours.

*Students not prepared for MH 161 must take MH 160 without credit.

**German through the first year sequence.

***A maximum of six hours of advanced ROTC may be substituted for electives in the junior or senior year. Students will be certified to the American Chemical Society as Certified Graduates when they have made up the electives for which advanced ROTC was substituted.

TOTAL — 205 QUARTER HOURS

GROUP REQUISITE: EC 200, PO 209, or SY 201.

APPROVED ELECTIVES: EC 200, 206; EH 253-254-255 or EH 260-261 or EH 270-271-272, 350, 365; GY 303; HY 201, 202; MU 373, 374; PO 209; PG 211; SY 201, TH 210.

Alternate Curriculum in Chemistry (BCH)

Biochemistry Option

FRESHMAN YEAR

First Quarter				Second Quarter				Third Quarter			
CH	111	General Chemistry	4	CH	112	General Chemistry	4	CH	113	General Chemistry	4
CH	111L	Gen. Chem. Lab.	1	CH	112L	Gen. Chem. Lab.	1	CH	113L	Gen. Chem. Lab.	1
MH	161	An. Geom. & Cal.	5	MH	162	An. Geom. & Cal.	5	MH	163	An. Geom. & Cal.	5
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3
HY	101	World History	3	HY	102	World History	3	HY	103	World History	3
		ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1

SOPHOMORE YEAR

EH	390	Adv. Comp.	5	CH	205	An. Chem. & Lab.	5	BI	101	Prin. of Biol. & Lab.	5
MH	264	An. Geom. & Cal.	5	PS	221	Gen. Physics II	4	CH	303	Organic Chemistry	5
PS	220	Gen. Physics I	4	MH	265	Lin. Diff. Equations	3	PS	222	Gen. Physics III	4
		ROTC or Elective	1			Elective	3			ROTC or Elective	1
						ROTC or Elective	1				

JUNIOR YEAR

BI	103	Animal Biol. & Lab.	5	CH	305	Organic Chemistry	5	CH	509	Physical Chemistry	5
CH	304	Organic Chemistry	5	CH	508	Physical Chemistry	5	BY	300	Gen. Microbiology	5
CH	507	Physical Chemistry	5	ZY	301	Compara. Anatomy	5	ZY	524	Animal Physiology	5
		Approved Elective	3			Approved Elective	3			Approved Elective	3

SENIOR YEAR

CH	518	Biochemistry	5	CH	519	Biochemistry	5	CH	520	Clin. Biochemistry	5
FL		German**	5	FL		German**	5	FL		German**	5
		Group Req.	5	CH	513	An. Chemistry	5			Approved Elective	3
		Approved Elective	3			Approved Elective	3			Approved Elective	3

*Students not prepared for MH 161 must take 160 without credit.

**German through the first year sequence.

TOTAL — 204 QUARTER HOURS

GROUP REQUISITE. EC 200, PO 209, or SY 201.

APPROVED ELECTIVES

EC	200	General Economics	5	HY	202	History of U.S.	5
EC	206	Socio-Economic Foundations of Contemporary America	3	MU	373	Appreciation of Music	3
EH	253	254-255 or EH 260-261-262	3-3-3	MU	374	Masterpieces of Music	3
EH	350	Shakespeare's Greatest Plays	3	PO	209	American Government	5
EH	365	Southern Literature	3	PG	211	Psychology	5
GY	303	The Soviet Union-Land and People	3	SY	201	Introduction to Sociology	5
HY	201	History of U.S.	5	TH	210	Theatre as Entertainment	3

Curriculum in Criminal Justice (CJ)

This curriculum prepares students for professional careers in criminal justice agencies at all levels of government. It offers two alternative specializations: *Law Enforcement*; or *Offender Rehabilitation* with options in either adult corrections or youth services.

The curriculum is administered by the Department of Political Science. This curriculum model does not show all the possible variations; students should consult the *Criminal Justice Adviser* before enrolling.

FRESHMAN YEAR

Second Year											
First Quarter				Second Quarter				Third Quarter			
Group Req. I .....3-5				Group Req. I .....3-5				Group Req. I .....3-5			
Group Req. II .....3-5				Group Req. II .....4-5				Group Req. III .....4-5			
EH	101	English Comp. ....3		EH	102	English Comp. ....3		EH	103	English Comp. ....3	
HY	101	World History .....3		HY	102	World History .....3		HY	103	World History .....3	
ROTC or Elective .....1				ROTC or Elective .....1				ROTC or Elective .....1			
PE		Physical Education .....2		PE		Physical Education* .....2		PE		Physical Education* .....2	

SOPHOMORE YEAR

ACF 211 or 215 Acct. **	4	PO 210 State & Loc. Govt.	5	EC 200 Economics I	5
PO 209 American Govt.	5	SY 201 Intr. Sociology	5	LE 260 Surv. of Law Enf.	5
PG 211 Psychology	5	Group Req. III	3-5	SC 202 or 211	3-5
EH Literature***	3	EH Literature***	3	EH Literature***	3
ROTC or Elective	1	ROTC or Elective	1	ROTC or Elective	1

*PE requisites: **Second Quarter.** PE 114C, 134, 132, 131 or 130. **Third Quarter.** PE 105, 162, 150, 230, or 231, or 102, or 103 as required.

**The student in *Youth Services Specialization* will substitute LE 335.

***EH 253-254-255 or EH 260-261-262; EH 270-271-272 or EH 250-251.

JUNIOR AND SENIOR YEARS

Junior and senior years all students will complete EHA 307; HED 396; LE 262, 270, 335, 464; PG 301; SY 204 (except CJY students); SCR 302, 308; PO 502.

Students in the *Law Enforcement Specialization* will complete LE 261, 361, 363, 461; PO 323, 325, 501, 515 and SY 505. The student in both the *Offender Rehabilitation Specialization* and the *Youth Services Specialization* will complete CED 521, SW 375 and three courses from SY 304, SCR 420, 426, 530.

The student in the *Youth Services Specialization* will complete FGD 267, 270, 302, 308, 310, and PO/SCR 415.

There are approved options for many of these required courses; students should consult with an *Arts and Sciences Evaluator* or the *Criminal Justice Adviser* before registration.

TOTAL — 201 QUARTER HOURS

GROUP REQUISITE I, Mathematics-Philosophy. One philosophy course (3-5) or one mathematics course (5). Any Auburn University philosophy course or comparable transfer credit in philosophy will fulfill the requirement. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of this Group Requisite as well. Group Requisite I may be completed in one quarter.

GROUP REQUISITE II. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, 101-103, 101-104, BI 101-108, 105-106, 105-107, 105-108; CH 101-102-104 or 103-104 or 111-112-113, GL 101-102, 110-103, PS 205-206-207, 220-221-222, PHS 100-101.

GROUP REQUISITE III. A minimum of 9 hours in Ascent of Man series, art, foreign language, geography, literature, music, philosophy, religion, or theatre courses.

Curriculum in Criminal Justice and Spanish (CJF)

This curriculum allows the student to combine preparation for professional practice of law enforcement and corrections with the development of a Spanish-speaking facility and knowledge of the cultural background of Spanish-speaking people. Given the substantial concentrations of Spanish-speaking people in many urban areas of the southern, western, and eastern United States and the relative lack of Spanish-speaking professionally trained criminal justicians, the curriculum enhances the probability of employment in every area of law enforcement, youth services, correctional services, and the Federal Immigration and Naturalization, and Customs Services.

Students will be placed in a field internship of 9 hours in a criminal justice agency serving Spanish-speaking clients. Students enrolled in the curriculum will receive academic and professional guidance from the Criminal Justice Program, Department of Political Science, and the Department of Foreign Languages.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
FL 131	First Yr. Span. I	FL 132	First Yr. Span. II	FL 133	First Yr. Span. III
EH 101	English Comp.	EH 102	English Comp.	EH 103	English Comp.
	Group Requisite I		Group Requisite I		Group Requisite I
HY 101	World History	HY 102	World History	HY 103	World History
PE	Physical Education	PE 134, 132, 131, or 130		PE 105, 162, 150, 230, or 231	

SOPHOMORE YEAR

FL 231	Second Yr. Span. I	FL 232	Second Yr. Span. II	FL 233	Second Yr. Span. III
PG 211	Psychology	SY 201	Intr. Sociology	PO 209	American Government
BI 105	Persp. in Biol.	BI 106	Human Biol.	EC 206	Socio-Economic Fnds.
EH 260	World Literature	EH 261	World Literature	EH 262	World Literature

JUNIOR AND SENIOR YEARS

Junior Year: During the junior year the student will complete the following: EHA 307; FL 331, 340; GY 304; HED 396 or 597; LE 260, 270, 262 or 335; PO 210; SCR 302 or PG 301, SY 304 or 520.

Senior Year: During the senior year the student will complete the following: LE 363 or SCR 530, LE 461 or SCR 426, LE 464; PO 336 or 502; fifteen hours chosen from ANT 401, 511; FL 332, 434-435, 333-334-335; HY 300, 552, 554; PO 318, 539, 542; and electives to total 201 quarter hours.

TOTAL — 201 QUARTER HOURS

GROUP REQUISITE I. Mathematics-Philosophy. One philosophy course (3-5) or one mathematics course (5). Any Auburn University philosophy course or comparable transfer credit in philosophy will fulfill the requirement. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of this Group Requisite as well. Group Requisite I may be completed in one quarter.

Curriculum in Criminology (SCR)

The curriculum in criminology represents a broad range of study and pre-professional preparation. The focus of study is upon the etiology of crime and society's reaction to it. The area more specifically emphasizes the sociology of law, research on crime and delinquency and theoretical developments in criminality and juvenile delinquency.

This curriculum prepares students for varied positions in governmental and private agencies which develop and implement programs related to law enforcement, court services, corrections, juvenile services and crime related research. The curriculum also provides the student with requisite skills for graduate study in the field of criminology or other related areas.

FRESHMAN YEAR														
First Quarter				Second Quarter				Third Quarter						
Group Requisite I . . . 3-5				Group Requisite I . . . 3-5				Group Requisite I . . . 3-5						
Group Requisite II . . . 4-5				Group Requisite II . . . 4-5				Group Requisite II . . . 4-5						
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3			
HY	101	World History	3	HY	102	World History	3	HY	103	World History	3			
								SY		201	Intr. to Sociology	5		
SOPHOMORE YEAR														
PO	209	American Govt.	5	PO	210	State & Loc. Govt.	5	PG	211	Intr. Psychology	5			
SY	204	Social Behavior	5	ANT	203	Intr. Anthropology	5	SCR	308	Juvenile Delinquency	5			
Group Requisite III . . . 4-5				Group Requisite III . . . 4-5				LE				260	Survey of Law	5
Literature*				Literature*									Enforcement	5
													Literature*	5

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
FL		First Yr. Lang. I .....5	FL		First Yr. Lang. II .....5	FL		First Yr. Lang. III .....5
EH	101	English Comp. ....3	EH	102	English Comp. ....3	EH	103	English Comp. ....3
HY	101	World History .....3	HY	102	World History .....3	HY	103	World History .....3
MH	140	or 160 Algebra or Alg./Trig. ....5	MH	161	or PA 111 Basic Reasoning .....3	SY	201	Intr. Sociology5

SOPHOMORE YEAR

FL		Sec. Yr. Lang. I .....5	FL		Sec. Yr. Lang. II .....5	FL		Sec. Yr. Lang. III .....5
		Science* .....5			Science* .....5	PO	209	American Govt. ....5
EC	200	Economics I .....5	EC	202	Economics II .....5	ACF	211	Accounting I .....4
EH	260	World Lit. I .....3	EH	261	World Lit. II .....3	EH	262	World Lit. III3

JUNIOR YEAR

FL		Conversation .....3	FL		Composition .....3	FL		Civilization .....3
PO	210	State & Local Govt. ....5	MT	331	Prin. of Mktg. ....5	MN	310	Prin. of Mgt. ....4
ACF	212	Accounting II .....4	GY	302	Econ. Geog. ....5	ACF	361	Business Finance .....5
EHA	315	B & P Rpt. Writing ....3	MN	207	Data Processing ....3			General Elective .....5
			EHA	415	Written Bus. Comm.3			

SENIOR YEAR

FL		Elective** .....3	FL		Elective** .....3	FL		520, 430, 450 .....3
		Intnl. Trade Elec. ....5	FL		329-339-359 .....3	EC	571	Intern. Economics .....5
		Intnl. Trade Elec.† .....5			A & S Elective*** .....5			A & S Elective .....5
		General Elective .....3			General Elective .....5			General Elective .....3

*10 hours from the following approved electives: BI 101-102, 101-103, BI 101-108, 105-106, 105-107, 105-108; CH 101-102-104, 103-104, GL 101-102, 110-103, PS 205-206-207, PS 220-221-222, PHS 100-101.

**300-level or above elective.

***10 hours from the following approved electives: GY 102, 215, 303, 304, 305, 306, 307, 308, 350, 401, HY 300, 301, 355, 356, 380, 527, 528, 529, 530, 532, 533, 537, 552, 554, 555, 572, PO 309, 311, 312, 314, 318, 445, 526, 535, 539, 540, RL 230, 301, SY 520, ANT 305, 511 or another foreign language.

†Students in FLT-Spanish are required to take EC 553.

Students may take no more than 25 percent of degree requirements in courses offered by the School of Business. This does not include the two courses in Economics, EC 200 and 202.

TOTAL — 201 QUARTER HOURS**Curriculum in Geology (GL)**

This curriculum prepares the student broadly in all aspects of geological processes and principles. This should enable him to make a more intelligent selection of employment or of a graduate program of study that will permit specialization in one or more of the many aspects of the science. Employment for the geologist ranges from federal and state service through university or college and industrial programs to private consulting.

The following four-year program satisfies the requirements for graduation with a Bachelor of Science degree in geology. (See also Earth Sciences major under Majors and Minors in the General Curriculum, page 81.)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI	101	Prin. of Biol. & Lab. ....5	BI	102	Plant Biology .....5	BI	103	Animal Biol. & Lab. ....5
GL	110	Physical Geology .....5	GL	103	Historical Geology .....5	MH	161	An. Geom. & Cal. ....5
EH	101	English Comp. ....3	EH	102	English Comp. ....3	EH	103	English Comp. ....3
HY	101	World History .....3	HY	102	World History .....3	HY	103	World History3

SOPHOMORE YEAR

CH	103	Chemistry & Lab. ....5	CH	104	Chemistry & Lab. ....5	CH	105	Chemistry & Lab. ....5
GL	205	Paleobotany .....5	GL	206	Invert. Paleozoology .....5	GL	240	Struct. & Geotect. ....5
MH	162	An. Geom. & Cal. ....5	MH	163	An. Geom. & Cal. ....5	PO	209	American Govt. ....5
EH		Literature** .....3	EH		Literature** .....3	EH		Literature**3

JUNIOR YEAR

GL	301	Mineralogy .....5	GL	302	Optical Mineralogy ....5	GL	305	Ign. & Met. Pet. ....5
PS	205	Intr. Physics I .....4	PS	206	Intr. Physics II .....4	PS	207	Intr. Physics III .....4
		Minor I .....5			Minor I .....5			Minor I .....5

SENIOR YEAR

GL 401	Sed. Pef. ....5	GL 411	Stratigraphy ....5	GL 421	Economic Geology ....5
	Group Requisite ....5		Minor II ....5		Minor II ....5
	Minor II ....5		Elective ....5		Elective ....3-5

*During the Summer Quarter following the second year, the student should take GL 215 (6), PO 210 (5) and TS 102 (2).

**EH 253-254-255 or EH 260-261-262 or EH 270-271-272 or EH 250-251.

TOTAL — 202 QUARTER HOURS

GROUP REQUISITE. A course in music, theatre, art, speech communication, journalism, economics, psychology or religion.

MINORS. Two 15-hour minors (or one 30-hour double minor) should be selected from those under the General Curriculum with the advice and approval of the student's departmental adviser. Students planning a minor in chemistry, civil engineering, or physics should also plan a second minor in mathematics.

Curriculum in Health Administration (HA)

This curriculum, leading to a Bachelor of Science degree, is designed to help prepare students for careers in such fields as hospital administration, health planning, nursing home administration, governmental health administration and other areas of health services administration. It is administered by the Department of Political Science. In addition to certain types of employment available immediately upon graduation from the undergraduate program, graduate training is available at other institutions through the Ph.D. level. Students interested in admission to such programs should maintain a B average, should take the appropriate Graduate Record Examination and should make application to the appropriate professional school about a year in advance of the expected date of graduation. Students should consult their Health Administration adviser for information on opportunities for employment after graduation and requirements for admission to graduate study.

No student currently on academic probation may transfer into this curriculum. No grades below C are accepted for transfer credit.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI	105	Persp. in Biol. ....5	BI	106	Human Biology ....5	PO	209	American Govt. ....5
MH	160	Pre-Cal. w/Trig. ....5	MH	161	An. Geom. & Cal. ....5	PA		Group Req. I ....3-5
EH	101	English Comp. ....3	EH	102	English Comp. ....3	EH	103	English Comp. ....3
HY	101	World History ....3	HY	102	World History ....3	HY	103	World History ....3

SOPHOMORE YEAR

		Group Req. II ....3-5	EC	200	Economics I ....5	EC	202	Economics II ....5
ACF	211	Prin. of Acct. I ....4	ACF	212	Prin. of Acct. II ....4	ACF	213	Mgt. Cost & Budg. ....4
SY	201	Intr. Sociology ....5	SY	220	Statistics ....5	PO	325	Intr. Pub. Admin. ....5
EH		Literature* ....3	EH		Literature* ....3	EH		Literature* ....3

*EH 253-254-255 or EH 260-261-262 or EH 270-271-272 or EH 250-251.

JUNIOR AND SENIOR YEARS

During the junior and senior years the student will complete the following special requirements: A) HA 360, HA 421, MN 207, PO 300, PO 326, PO 501 or 502, SY 577, and b) the requirements of either the HSA or HSM major.

THE HEALTH SERVICES ADMINISTRATION MAJOR (HSA). Students who select this major will take HA 420, 450, 451, 510 and one of the following — HA 530, HA 531, HA 539; in addition, they will take MN 307, PG 561, PO 333, 410, 517, and SC 204.

THE HEALTH SYSTEMS ADMINISTRATION MAJOR (HSM). Students who select this major will take HA 420, 450, 451, 510 and one of the following — HA 530, HA 531, HA 539; in addition, they will take ACF 311, 312, 361, 410, PG 561, and PO 410.

Students in both majors are expected to consult regularly with their HA adviser for purposes of pre-registration and advance planning for coursework, particularly their required administrative internship.

TOTAL — 207 QUARTER HOURS

GROUP REQUISITE I. PA 111 or a 200-level philosophy course.

GROUP REQUISITE II. EHA 315 or EH 390 or SC 211.

Curriculum in Laboratory Technology (LT) and Medical Technology (MDT)

This curriculum, leading to the degree of Bachelor of Science in Laboratory Technology or Bachelor of Science in Medical Technology, is designed to prepare students for medical laboratory careers in fields such as public health, bacteriology, environmental testing, industrial quality control, research and forensic science. Graduates of this curriculum may choose to qualify as certified medical technologists. This can be accomplished by successfully completing a 12-month training period (rotating hospital internship) in an accredited School of Medical Technology and passing a national certifying examination.

The requirement for the degree of Bachelor of Science in Laboratory Technology is the successful completion of the 12 quarters of the laboratory technology curriculum. Upon graduation a student may enter the work force in a laboratory field or may choose to begin a 12-month training period in a School of Medical Technology. Upon completion of the training and successful completion of a national certifying examination this graduate will be certified as a medical technologist.

The Medical Technology option leads to the Bachelor of Science degree in Medical Technology (conferred by Auburn University). Degree requirements include successful completion of the first nine quarters of the laboratory technology curriculum and of the 12-month period in a School of Medical Technology approved by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) and by the Head of the Department of Chemistry at Auburn University. This school must be affiliated with Auburn University. Graduates of this curriculum should plan to become certified medical technologists by passing one of the national certifying examinations administered by an approved certifying body.

Further requirements for the Medical Technology Option include: (1) Auburn University Students transferring into medical technology must complete one academic year (54 hours) in the laboratory technology curriculum preceding the year of internship, and (2) transfers from other institutions must complete the junior year of the laboratory technology curriculum at Auburn prior to internship.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH	103	Gen. Chem. & Lab.5	BI	101	Prin. Biol. & Lab.5	BI	103	Animal Biol. & Lab.5
MH	160	Pre-Cal. w/Trig.5	CH	104	Gen. Chem. & Lab.5	CH	105	Gen. Chem. & Lab.5
EH	101	English Comp.3	EH	102	English Comp.3	MH	161	An. Geom. & Cal.5
HY	101	World History3	HY	102	World History3	EH	103	English Comp.3
LT	101	Orientation1						

SOPHOMORE YEAR

CH	207	Organic Chem. & Lab.5	CH	208	Organic Chem. & Lab.5	CH	204	An. Chem. & Lab.5
PS	205	Intr. Physics I4	PS	206	Intr. Physics II4	BY	300	Gen. Microbiology5
HY	103	World History3	ZY	250	Human Anatomy5	ZY	251	Physiology5
HED	195	Health Science2			Elective3	PS	207	Intr. Physics III4

JUNIOR YEAR

CH	301	Biochemistry5	CH	302	Biochemistry5	CH	520	Clin. Biochemistry5
LT	301	Hematology5	LT	404	Immunology I5			Group Requisite I5
HY	306	Contemp. Affairs3	LT	401	Adv. Hematology5	BY	446	Clin. Microbiology5
ZY	511	Parasitology5				LT	405	Immunology II5

SENIOR YEAR

ZY	308	Micrology5	ZY	509	Histology5			Group Requisite II5
EHA	304	Technical Writing3	SC	202	App. Sp. Comm.3			Elective10
		Elective6			Elective9			
LT	525	Clin. Instr.5						

MEDICAL TECHNOLOGY OPTION — (PROFESSIONAL YEAR) — A 12-month training program undertaken at an accredited School of Medical Technology.

SENIOR YEAR

MDT	406	Ci. Hematology12	MDT	402	Ci. Microbiol.10	MDT	425	Chemistry16
MDT	408	Immunohematology4	MDT	405	Ci. Parasitology3	MDT	401	Urinalysis3
			MDT	407	Ci. Serology3			

TOTAL — 205 QUARTER HOURS

GROUP REQUISITE I. EC 200, PO 209, SY 201, or PA 211.

GROUP REQUISITE II. ZY 300, 310, or 524.

Approved Electives: EC 200, 206; EH 253-254-255 or 260-261-262, 270-271-272, 350, 365; FL (French or German through the first two quarters of the first year sequence as a minimum); GY 303; HY 201, 202; MN 207; MU 373, 374; PA 111, PA 211; PO 209; PG 211; SY 201; and TH 210.

Curriculum in Mathematics (MH)

This curriculum is designed to prepare students for graduate study and eventual careers as mathematicians. In order to graduate with a major in mathematics, a student must have an overall C average or better in all mathematics courses attempted which are required for the major, above the 100-level, and for which a grade other than W has been assigned. The General Curriculum should be used by students who prefer flexibility in the design of their program (see page 81.)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
FL		Foreign Language* . . . 5	FL		Foreign Language* . . . 5	FL		Foreign Language* . . . 5
MH	161	An. Geom. & Cal. . . . 5	MH	162	An. Geom. & Cal. . . . 5	MH	163	An. Geom. & Cal. . . . 5
EH	101	English Comp. . . . 3	EH	102	English Comp. . . . 3	EH	103	English Comp. . . . 3
HY	101	World History 3	HY	102	World History 3	HY	103	World History 3
		ROTC or Elective 1			ROTC or Elective 1			ROTC or Elective 1

SOPHOMORE YEAR

MH	264	An. Geom. & Cal. . . . 5	MH	265	Lin. Diff. Equations . . . 3	MH	331	Intr. Mod. Alg. I 5
		Natural Science† . . . 4-5	MH	266	Top. in Lin. Alg. . . . 3			Natural Science . . . 4-5
EH		Literature†† 3			Natural Science . . . 4-5	EH		Literature†† 3
		ROTC or Elective 1	EH		Literature†† 3			ROTC or Elective 1
					ROTC or Elective 1			

JUNIOR YEAR

FL		Foreign Language* . . . 5	FL		Foreign Language* . . . 5	FL		Foreign Language* . . . 5
MH	332	Intr. Mod. Alg. II . . . 5	MH	531	Intr. Mod. Alg. III . . . 5	MH	521	Analysis II 5
		Elective††† 3	MH	520	Analysis I 5			Requisite 3-5
		Elective 3			Elective 3			Elective 3

SENIOR YEAR

MH	522	Analysis III 5	MH		Requisite 5	MH		Requisite 5
		Requisite 3-5			Group Requisite . . . 5			Group Requisite . . . 5
		Elective 5			Elective 5			Elective 5
		Elective 3			Elective 3			Elective 3

*Completion of two languages, French, German, Russian, through the first year sequence or one of these languages through the second year sequence.

††Students not prepared for MH 161 must take MH 160 without credit.

†The natural science requirement may be met by taking PS 220-221-222 or CH 111-112-113. If the 12-hour physics sequence is selected, an additional 3-hour elective will be needed to meet the 196-hour requirement.

†††EH 253-254-255 or 260-261-262 or 270-271-272.

†††Appropriate electives to meet the interests of the student may be selected in consultation with his departmental adviser.

TOTAL — 196 QUARTER HOURS

GROUP REQUISITES. These requisites are chosen from one of the following areas of social science: economics, education, history, political science, psychology, or sociology.

Curriculum in Applied Mathematics (AMH)

This is a mathematics curriculum of substance suitable for those preparing for graduate work in mathematics as well as for those anticipating careers supported by significant applied mathematics.

An important feature is the option for the student to concentrate, by means of technical electives, on an important area to which mathematics can be applied: one of the traditionally allied fields such as engineering, physical science, or computer science; or the more recently allied areas such as the biological, behavioral, or managerial sciences. By selecting the discrete mathematics option starting in the junior year a student can

develop the background in mathematics needed to support graduate work in computer science. Students using this curriculum in preparing for graduate study in mathematics should be aware of the foreign language requirements for advanced degrees. In order to graduate with a major in mathematics, a student must have an overall C average or better in all mathematics courses attempted for the major, above the 100-level, and for which a grade other than W has been assigned.

Students who desire more flexibility or more emphasis on the liberal arts should pursue the MH or GMH curriculum.

FRESHMAN YEAR		
First Quarter		Second Quarter
MH 161 An. Geom. Cal. ....5	MH 162 An. Geom. Cal. ....5	MH 163 An. Geom. Cal. ....5
EH 101 English Comp. ....3	EH 102 English Comp. ....3	EH 103 English Comp. ....3
HY 101 World History** ....3	HY 102 World History** ....3	HY 102 World History** ....3
Science*** ....5	Science*** ....5	PS 220 General Physics I ....3
ROTC or Elective ....1	ROTC or Elective ....1	PS 220L Gen. Physics Lab. I ....1
		ROTC or Elective ....1
SOPHOMORE YEAR		
MH 264 An. Geom. Cal. ....5	MH 269 Elem. Diff. Eqns. ....5	MH 337 Intr. Linear Alg. ....5
MH 271 Intr. Math Program ....3	MH 331 Intr. Modern Alg. I ....5	MH 332 Intr. Modern Alg. II ....5
PS 221 General Physics II ....3	PS 222 General Physics III ....3	Group Requisite I ....3
PS 221L Gen. Physics Lab II ....1	PS 222L Gen. Physics Lab III ....1	Group Requisite II ....3
Group Requisite II ....5	Group Requisite II ....3	
JUNIOR YEAR		
MH 520 Analysis I ....5	MH 521 Analysis II ....5	MH 522 Analysis III ....5
MH 567 Probability Thy. ....5	MH 568 Math. Statistics I ....5	Appl. Math. Requisite 5
Group Requisite I ....3	Group Requisite I ....3	Group Requisite I ....5
Group Requisite II ....3	Group Requisite II ....3	Group Requisite II ....3
SENIOR YEAR		
MH 560 Intr. Numer. An. ....5	MH 561 Numer. Matrix An. I ....5	Appl. Math. Requisite 5
Appl. Math. Requisite 5	Appl. Math. Requisite 5	Group Requisite I ....5
Group Requisite I ....3	Group Requisite I ....3	Elective ....7
Elective ....4	Elective ....4	
DISCRETE MATHEMATICS OPTION		
JUNIOR YEAR		
MH 577 Comb. Designs ....5	Appl. Math. Requisite 5	Appl. Math. Requisite 5
MH 520 Analysis I ....5	MH 521 Analysis II ....5	Math. Elective ....5
Group Requisite I ....3	Group Requisite I ....3	Group Requisite I ....5
Group Requisite II ....3	Group Requisite II ....3	Group Requisite II ....3
SENIOR YEAR		
MH 537 Linear Algebra ....5	MH 560 Intr. Numer. An. or	Appl. Math. Requisite 10
Appl. Math. Requisite 5	MH 561 Numer. Matrix An. I ....5	Group Requisite I ....5
Group Requisite I ....3	Appl. Math. Requisite 5	Elective ....7
Elective ....4	Group Requisite I ....3	
	Elective ....4	

*Students not prepared for MH 161 must take MH 160 without credit.

**Students may substitute HY 204-205-206 for HY 101-102-103.

***CH 103-103L-104-104L or BI 101-102 or BI 101-103.

TOTAL — 201 QUARTER HOURS

APPLIED MATHEMATICS REQUISITES

Students not in the discrete option will select, in consultation with a departmental adviser, 20 hours of upper division mathematics. Students electing the discrete mathematics option will select 25 hours from MH 339, 512, 515, 516, 571, 573, 575.

GROUP REQUISITE I. A minimum of 25 hours of requisite credit must be taken in areas especially concerned with the application of mathematics. At least 15 hours must be taken in the same area. Lists of acceptable courses in each of these areas are available through the Departmental Office. The primary areas for such concentration are:

Botany-Zoology	Physics	Civil Engineering
Chemistry	Psychology	Computer Science and Engineering
Economics	Aerospace Engineering	Electrical Engineering
Geology	Chemical Engineering	Industrial Engineering
		Mechanical Engineering

Computer Science Concentration

Students who wish a concentration in computer science are advised to select courses from the following: EE 330, 335, 430, 521; CSE 200, 220, 230, 301, 340, 350, 360, 500, 501, 505, 511, 512, 520, 521, 522, 523, 530, 531, 540.

GROUP REQUISITE II. A minimum of 20 hours of requisite credit must be taken in the social sciences area and in the humanities and fine arts area with at least one course in each of the two areas. Students planning graduate study beyond the Master's level should include a foreign language in Group Requisite II; in such case they must also take a social science course of at least five hours credit.

Curriculum in Physics (PS)

This curriculum provides a thorough understanding of the field of physics and develops the ability to apply theoretical and experimental techniques to a wide range of problems. It provides a firm foundation for careers in physics and related fields and an excellent preparation for further graduate study.

Graduates find opportunities in industrial and government research and development; chemical, geological, biological and mathematical physics; medical and dental research; environmental science; and teaching and/or research to the college or university level.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH	111	General Chemistry5	CH	112	General Chemistry5	CH	113	General Chemistry5
MH	161	An. Geom. & Cal.*5	MH	162	An. Geom. & Cal.5	MH	163	An. Geom. & Cal.5
EH	101	English Comp.3	EH	102	English Comp.3	PS	220	General Physics I4
HY	204	Technology & Civil** . . .3	HY	205	Technology & Civil** . . .3	HY	206	Technology & Civil** . . .3
		ROTC or Elective1			ROTC or Elective1			ROTC or Elective1
		Elective1			Elective1			Elective1

SOPHOMORE YEAR

MH	264	An. Geom. & Cal.5	MH	269	Elem. Diff. Equations . . .5	PS	302	Electronics5
PS	221	General Physics II4	PS	222	General Physics III4	PS	305	Intr. Modern Physics . . .4
EH	103	English Comp.3	IE	300	Computer	MH	362	Engineering Math I3
		Elective5			Programming3			Elective3
		ROTC or Elective1			Group Requisite5			ROTC or Elective1
					ROTC or Elective1			

JUNIOR YEAR

PS	300	Electricity & Magnet4	PS	501	Mechanics I5	PS	502	Mechanics II5
MH	501	Vector Calculus3	PS	301	Electricity and Magnet . .4	PS	303	Optics4
		Group Requisite5	PS	306	Physics Laboratory2	MH	506	Partial Diff. Equat. . . .3
		Elective5			Group Requisite5			Group Requisite5

SENIOR YEAR

PS	515	Modern Physics I5	PS	516	Modern Physics II5	PS	507	Exp. Physics II2
PS	506	Exp. Physics I2	PS	504	Stat. Thermodynamics . .5	PS	520	Nuclear & Elem. Part . . .5
		Physics Elective3			Physics Elective3			Elective5
		Electives7			Elective3			Elective5

*Students not prepared for MH 161 must take MH 160 without credit.

**Students may substitute HY 101-102-103 for HY 204-205-206.

TOTAL — 207 QUARTER HOURS

GROUP REQUISITES. A minimum total of 20 hours of requisite credit must be taken in the social sciences area and in the humanities and fine arts area with at least one course in each of the two areas. Students planning graduate study in science are encouraged to complete one year of study in French, German, or Russian as part of the Group Requisite.

Curriculum in Applied Physics (APS)

This curriculum provides a foundation in physics and emphasizes several related technical fields to provide a broader base for persons who desire to enter industrial and governmental laboratories. Individuals wishing to pursue graduate work will find that this curriculum also provides adequate preparation for advanced study.

During the junior and senior years, 20 hours of specialized courses are designated as Group Requisite I. These are to be chosen from one of the following areas: chemistry; geology; aerospace, chemical, electrical, or mechanical engineering; mathematics; or computer, environmental or nuclear science.

Students anticipating graduate work should complete French, German, or Russian through the first year sequence as a part of Group Requisite II. (See below.)

To those who are motivated as doers, who desire full understanding of how the physical world works, this curriculum will provide a challenge and a stimulus.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH	111	General Chemistry ...5	CH	112	General Chemistry ...5	CH	113	General Chemistry ...5
MH	161	An. Geom. & Cal.* ...5	MH	162	An. Geom. & Cal.* ...5	MH	163	An. Geom. & Cal.* ...5
EH	101	English Composition ...3	EH	102	English Composition ...3	PS	220	General Physics I ...4
HY	204	Technology & Civil** ...3	HY	205	Technology & Civil** ...3	HY	206	Technology & Civil** ...3
		ROTC or Elective ...1			ROTC or Elective ...1			ROTC or Elective ...1
		Elective ...1			Elective ...1			Elective ...1

SOPHOMORE YEAR

MH	264	An. Geom. & Cal.* ...5	PS	222	General Physics III ...4	PS	302	Electronics ...5
PS	221	General Physics II ...4	MH	265	Lin. Diff. Equations ...3	PS	305	Intr. Modern Physics ...4
ME	205	Appl. Mech. Stat.* ...4	IE	300	Computer Prog. ...3	MH	266	Topics Lin. Algebra ...3
EH	103	English Composition ...3	IE	102	Graphical			Group Requisite I ...5
IE	113	Tool Lab ...1			Comm. Des. ...2			ROTC or Elective ...1
		ROTC or Elective ...1			Group Requisite I ...5			
					ROTC or Elective ...1			

JUNIOR YEAR

PS	521	Modern Electronics ...5	PS	501	Mechanics I ...5	PS	502	Mechanics II ...5
PS	300	Elec. & Magnetism I ...4	PS	301	Elec. & Magnetism II ...4	PS	303	Optics ...4
MH	501	Cal. Vector Functions ...3	PS	306	Physics Lab. ...2	MH	506	Partial Diff. Equations ...3
		Group Requisite II ...5			Group Requisite II ...5			Group Requisite I ...5

SENIOR YEAR

PS	515	Modern Physics I ...5	PS	516	Modern Physics II ...5	PS	507	Exp. Physics II ...2
PS	506	Exp. Physics I ...2	PS	504	Stat. Thermodynamics ...5	PS	520	Nuclear & Elem. Part ...5
		Group Requisite II ...5			Group Requisite I ...5			Group Requisite II ...5
		Elective ...3						Elective ...6

*Students not prepared for MH 161 must take MH 160 without credit.

**Students may substitute HY 101-102-103 for HY 204-205-206.

***Students selecting field other than engineering for their specialization area (via Group Requisite I) may take an additional course in that area as a substitution for ME 205.

TOTAL — 207 QUARTER HOURS

GROUP REQUISITE I. Courses to be used to satisfy this requirement are to be selected by the student after consultation with and a recommendation by the department(s) in which the courses are to be taken and upon the approval of his adviser.

GROUP REQUISITE II. A minimum total of 20 hours of requisite credit must be taken in the social sciences area and in the humanities and fine arts area with at least one course in each of the two areas. Students planning graduate study should include a foreign language in Group Requisite II as mentioned above; in such case they must also take a social science course for at least five hours credit.

Curriculum in Public Administration (PUB)

This curriculum, which is administered by the Department of Political Science, is designed to educate students for careers in the administration of governmental units. Students in this curriculum generally aspire to positions of leadership and responsibility in the public service. Much of the specialized coursework of the junior and senior years focuses on (1) public administrative processes and (2) the place of public administration in the political system. Students should regularly consult their adviser for assistance in planning this coursework.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
PA	202	Ethics and Society ...5	PO	209	American Govt. ...5	PO	210	Am. State & Loc. Govt. ...5
		Group Req. I ...4-5			Group Req. I ...4-5			Group Req. I ...4-5
EH	101	English Comp. ...3	EH	102	English Comp. ...3	EH	103	English Comp. ...3
HY	101	World History ...3	HY	102	World History ...3	HY	103	World History ...3
		Elective ...1			Elective ...1			Elective ...1

SOPHOMORE YEAR

EC 200	Economics I5	SY 201	Intr. Sociology5	EC 202	Economics II5
ACF 211	Prin. of Accounting4	PO 302	Intr. Pol. Thought5	SY 202	Social Problems5
	Group Req. II3-5		Group Req. II3-5		Group Req. II3-5
EH	Literature*3	EH	Literature*3	EH	Literature*3
	Elective1		Elective1		Elective1

*EH 253-254-255 or EH 260-261-262 or EH 270-271-272 or EH 250-251.

JUNIOR AND SENIOR YEARS

The student will complete the following: (a) PO 300, 323, 325, 326, 327, 328, 333, 501 or 502; 514, 515, 518, PG 211; (b) Group Requisite III; (c) at least 12 hours from the following: PO 320, 410, 450-451, 505, 517, 552; (d) Related courses requirement. At least 13 hours of course related to the student's curriculum and particular interests. See PUB adviser for possible course selections.

TOTAL — 201 QUARTER HOURS

In this curriculum, no grades below C are accepted for transfer credit. Transfer students must have a 2.0 Grade Point Average. For graduation, students must maintain an overall average of C or better on PUB required courses listed in Section (a) of the curriculum for junior and senior years (i.e. PO 325, 300, 323, 326, 327, 328, 333, 501 or 502, 514, 515, 518, and PG 211). No more than 15 hours toward the PUB degree may be earned via internship and readings credit.

GROUP REQUISITE I. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 105-106, 105-107, 105-108, CH 101-102-104, 103-104, GL 101-102, 110-103, PS 205-206-207, 220-221-222, PHS 100-101

GROUP REQUISITE II. The student will choose any three courses from the following: Mathematics, HY 201, 202, PA 210, GY 302, JM 315, SC 202, FL through the first two quarters of the first year sequence as a minimum (See page 83.)

GROUP REQUISITE III. The student will fulfill this tool skills requirement by completing the third quarter of a foreign language sequence, or a statistics, computer, or a governmental accounting course approved by the student's adviser.

Curriculum in Public Relations (PRJ or PRS)

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
FL	Foreign Language*5	FL	Foreign Language*5	FL	Foreign Language*5
	Group Req. I3-5		Group Req. I3-5		Group Req. I3-5
EH 101	English Comp.3	EH 102	English Comp.3	EH 103	English Comp.3
HY 101	World History3	HY 102	World History3	HY 103	World History3
	ROTC or Elective1		ROTC or Elective1	JM 101	Newspaper Style3
					ROTC or Elective1

*A foreign language through the first year sequence as a minimum.

SOPHOMORE YEAR

PO 209	American Govt.5	PO 210	State & Loc. Govt. . . .5	SY 201	Intr. Sociology5
	Major Course3-5		Major Course3-5		Major Course3-5
	Group Req. II5		Group Req. II5		Intr. Pub. Rel.**5
EH	Literature***3	EH	Literature***3	EH	Literature***3
	ROTC or Elective1		ROTC or Elective1		ROTC or Elective1

**Either JM 204 or SC 204 may be taken depending upon the student's major.

***EH 253-254-255 or EH 260-261-262 or EH 270-271-272 or EH 250-251.

JUNIOR AND SENIOR YEARS

The student in the Public Relations Curriculum will select a major in Journalism (PRJ) with a minor in Speech Communication or a major in Speech Communication (PRS) with a minor in Journalism and elective work to total 201 hours.

TOTAL — 201 QUARTER HOURS

GROUP REQUISITE I. Mathematics-Philosophy. One philosophy course (3-5) or one mathematics course (5). Any Auburn University philosophy course or comparable transfer credit in philosophy will fulfill the requirement. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of this Group Requisite as well. Group Requisite I may be completed in one quarter.

GROUP REQUISITE II. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, 101-103, BI 101-108, 105-106, 105-107, 105-108, CH 101-102-104 or 103-104 or 111-112-113; GL 101-102, 110-103; PS 205-206-207, 220-221-222, PHS 100-101.

MINOR

The minor in Speech Communication will consist of three of the following:

SC 301	Speech Comm. Theories5	SC 336	Tel. Production-Direction I5
SC 211	Public Speaking5	SC 338	Broadcast News Writing5

The minor in Journalism will consist of three of the following:

JM 221	Beginning News Writing	5	JM 321	Newspaper Makeup and Layout	5
JM 313	Reporting	5	JM 322	Feature Writing	5
JM 314	Copy reading & Editing	3			

The student will take at least 20 hours from the following courses:

MT 241	Business Law	4	PG 431	Social Psychology	5
MT 331	Prin. of Marketing	5	PO 341	Pressure Groups	3
MT 332	Market Comm. Mgt.	5	PO 342	Politics & the Media	5
MT 341	Consumer Analysis	5	EHA 304	Technical Writing	3
SY 204	Social Behavior	5	EHA 315	B & P Report Writing	3
SY 507	Pub. Opinion and Propaganda	5	EH 390	Advanced Composition	5
PG 211	Psychology	5	EHA 415	Written Business Comm.	3
EC 200	Economics I	5	EHA 416	App. Writ. & Editing	3
EC 202	Economics II	5			

Curriculum in Social Work — Child Welfare (CSW)

This curriculum allows the student to combine preparation for general professional Social Work practice with development of additional knowledge about family functioning and child welfare practice. Students will be placed in a field internship of 15 hours in a social service agency serving families and/or children. Graduates will earn a Bachelor of Science degree.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI 105	Perspectives in Biol.	5	BI 106	Human Biol.	5	SY 301	Sociol. of Family	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
GY 102	World Geography	5	SY 201	Intr. Sociology	5	SW 375	Intr. Social Welfare	5
	Group Requisite I	5		Group Requisite I	5	SC 273	Group Discussion	5

SOPHOMORE YEAR

EH 260	Lit. of Western World*	3	EH 261	Lit. of Western World	3	EH 262	Lit. of Western World	3
	Group Requisite II	3-5		Group Requisite II	3-5		Grp. Requisite II or	
SW 376	Community Soc. Services	5	PO 210	Am. St. & Local Govt.	5	EC 380	Elec.	3
PO 209	American Govt.	5	SY 220	Statistics	5		Economics I	3
						SW 380	Fnds. Social Work	5
							Group Requisite III	4

JUNIOR YEAR

HY 315	Am. Black History	5	PG 399A	Psychology	5	SY 304	Minorities*	5
FCD 399A	Project Uplift	2	FCD 399A	Project Uplift	2	FCD 399A	Project Uplift	2
	Group Requisite III	4		Group Requisite III	4	SW 506	Methods I	5
PG 211	Psychology	5		Group Requisite IV	5	SW 320	Field Practicum	4

SENIOR YEAR

SY 370	Methods Social Res.	5	SW 377	Child Wel. Practice	5	SW 520	Field Placement	15
SW 507	Methods II	5	SW 508	Methods III	3			
	Elective	2	SW 575	Social Policy	5			
	Group Requisite III	4		Group Requisite III	4			

*Students using World History or Technology and Civilization in the Group Requisite II may substitute EH 253-254-255 or 270-271-272 or 250-251.

**Or SY 520 Race Relations if not elected under Group IV.

TOTAL — 204 QUARTER HOURS

GROUP REQUISITE I, Mathematics-Philosophy. One philosophy course (3-5) or one mathematics course (5). Any Auburn University philosophy course or comparable transfer credit in philosophy will fulfill the requirement. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of this Group Requisite as well. Group Requisite I may be completed in one quarter.

GROUP REQUISITE II, History. The student may elect the world history sequence, HY 101-102-103 or the American History sequence, HY 201-202 or the Technology and Civilization sequence, HY 204-205-206.

GROUP REQUISITE III, Family and Child Development. Select 20 hours from the following: FCD 280, 301, 302, 306, 308, 347, 420, 467.

GROUP REQUISITE IV, Social Sciences. Select one course from the following: PG 350, 536, SC 503, 509, SY 520.

Curriculum in Spanish and Social Work (FSW)

This curriculum allows the student to combine preparation for professional practice of Social Work with the development of a Spanish-speaking facility and knowledge of the cultural background of Spanish-speaking people. Given the substantial concentrations of Spanish-speaking people in many urban areas of southern, western, and eastern United States and the relative lack of Spanish-speaking professionally trained social workers, the curriculum enhances the probability of employment in every area of social services, family and child services, mental health services, employment training and placement services, correctional services, and services for the aged.

Students will be placed in a field internship of 15 hours in a social service agency serving Spanish-speaking clients. Students enrolled in the curriculum will receive academic and professional guidance from the Department of Foreign Languages and the Social Work Program, Department of Sociology and Anthropology.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
FL	131	1st Year Spanish I5	FL	132	1st Year Spanish II5	FL	133	1st Year Spanish III5
		Group Req. I3-5			Group Req. I3-5			Group Req. I3-5
EH	101	English Composition3	EH	102	English Composition3	EH	103	English Composition3
HY	101	World History3	HY	102	World History3	HY	103	World History3

SOPHOMORE YEAR

FL	231	2nd Year Spanish I5	FL	232	2nd Year Spanish II5	FL	233	2nd Year Spanish III5
PG	212	Psychology5	SY	201	Intr. Sociology5	FL		Elective*5
BI	105	Persp. in Biol.5	BI	106	Human Biol.5	EC		Economics3-5
EH	260	Literature3	EH	261	Literature3	EH	262	Literature3

GROUP REQUISITE I, Mathematics-Philosophy. One philosophy course (3-5) or one mathematics course (5). Any Auburn University philosophy course or comparable transfer credit in philosophy will fulfill the requirement. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of this Group Requisite as well. Group Requisite I may be completed in one quarter.

JUNIOR AND SENIOR YEARS

During the junior year the student will complete the following:

SW	375	Intr. Social Welfare5	SY	220	Statistics5
SW	376	Community Social Services5	SY	370	Methods of Social Res.5
SY	304	Minority Groups5	PO	209	American Govt.5
		or	SW	320	Field Practicum4
SY	520	Rac. & Ethnic Relations5	GY	304	Latin America5
			PG		Psychology5

During the senior year the student will complete the following:

SW	380	Foundations of Social Work	5	FIFTEEN HOURS CHOSEN FROM THE FOLLOWING:	
SW	506	Social Work Methods I	5	ANT 401 Kinship, Marriage & Fam.	5
SW	507	Social Work Methods II	5	ANT 511 Language and Culture	5
SW	508	Social Work Methods III	3	FL 331 Spanish Conv.	3-5
SW	575	Social Work Policy	5	FL 332 Spanish Comp.	3-5
SW	520	Social Work Field Place	1-15	FL 336-337 Spanish Civil.	3-10
PO	210	State & Local Govt.	5	FL 434-435 Spanish Am. Lit.	3-6
		Elective*	3-5	FL 333-334-335 Spanish Amer. Civil	3-9
		Elective*	3-5	HY 300 Intr. Latin-Am. History	3
		Elective*	3-5	HY 554 History of Mexico	5
		Elective*	3-5	HY 552 History Caribbean Area	5
				PO 539 Govt. & Pol. Latin America	5
				PO 318 Latin America & United Sts.	3

*Elective to total 200 quarter hours.

TOTAL — 200 QUARTER HOURS

School of Business

ETHEL B. JONES, *Acting Dean*
AMITAVA MITRA, *Acting Assistant Dean*

THE SCHOOL OF BUSINESS prepares students to become effective and socially responsible managers of business and industrial organizations and government agencies and responsible citizens and leaders of society.

To achieve this goal, the School offers undergraduate programs leading to the Bachelor of Science in Business Administration. In addition, it offers graduate work for the degrees of Master of Business Administration (MBA), Master of Science (MS) in both Economics and Business, the Master of Arts in College Teaching (MACT), and the Doctor of Philosophy in Economics. For the degree of Master of Science in Business (MS), students are currently being enrolled in the Management Department concentration options of Human Resource Management, Management Information Systems, and Production/Operations Management. These programs have been accredited by the American Assembly of Collegiate Schools of Business. More detailed information on the graduate programs may be found in the *Graduate School Bulletin*.

Curriculum

The undergraduate curriculum includes a two-year Pre-Business Program required of all students and a two-year Professional Option Program. These programs provide a balanced course of study for all students, with approximately one-half of the hours in business and economics courses and one-half in courses offered outside the School. The courses required have been selected so that all students will have access to the "common body of knowledge" as designated by the American Assembly of Collegiate Schools of Business.

The Pre-Business Program, a plan followed by all business students in their freshman and sophomore years, provides a sound foundation of work in the arts and sciences, including courses in mathematics, humanities, social sciences, and natural sciences. This lower division program also includes some of the introductory business courses.

The Professional Option Programs are offered through the Departments of Accounting and Finance; Economics; Management; and of Marketing and Transportation and Physical Distribution. The Professional Option plans allow each student to concentrate in an area of interest during the junior and senior years. The ten options available include: Accounting (AC), Finance (FI), International Business (IB), Economics (EC), Management (MN), General Business-Theatre (GBT), Industrial/Operations Management (IOM), Personnel Management and Industrial Relations (PIR), Marketing (MK) and Transportation and Physical Distribution (TN). Through these programs, the School seeks to develop in its students the analytical, decision-making and communication skills required of managers who lead modern organizations.

Admissions

Students entering the Pre-Business Program directly from high school or another college or university, in addition to meeting Auburn University's admission requirements found on page 15, should have competence in the mathematics taught in high school geometry and second year algebra. Entering freshmen are expected to have at least an 18 ACT or 870 SAT score. Students also may transfer into the program from another school on campus if they have attained an overall grade point average of at least 2.00 on all courses attempted at Auburn University.

Graduation Requirements

To be graduated, business students must meet the hours and subject matter requirements of their curricula and must have an overall average of at least 2.00 on all courses attempted at Auburn University.

Student Advising System

The Office of Student Affairs of the School of Business is responsible for orienting all new students, freshmen and transferees to the School. All students report each quarter to Student Affairs, Thach 215, to plan their academic schedules and to obtain information.

Faculty members are available to all students for academic counseling and career guidance. Students are encouraged to seek advice on professional and academic questions from department heads and faculty through personal arrangements or appointments made by Student Affairs.

Cooperative Education Program

Business students are eligible to participate in the University's Cooperative Education Program (see page 40). This program allows students to combine academic training with actual business experience.

Dual Degree Program With Engineering

The Dual Degree Program in Business and Engineering at Auburn University is designed to give students the opportunity to prepare a curriculum plan which will result in a Bachelor of Science in Business Administration and a bachelor's degree in an Engineering curriculum.

Students may enter the Dual Degree Program by enrolling either in the School of Business or in the School of Engineering and by declaring an intention to study for this dual objective. An academic adviser is assigned in each School and advising is completed in both areas prior to registration each quarter. At the end of approximately five years of study, students are awarded degrees simultaneously by both Schools.

Pre-Business Program

The requirements of the Pre-Business Program are given in the model below. Students who enter from high school register in this program until they complete all Pre-Business requirements. Students who enter by transfer and who have not yet completed all Pre-Business requirements, must register in the Pre-Business Program.

Before being admitted into a Professional Option Program, business students must complete all courses in the Pre-Business Program with a satisfactory academic record.

Pre-Business Program

First Quarter			FRESHMAN YEAR			Second Quarter			Third Quarter		
MH	140	College Algebra	5	MH	161	An. Geom. & Cal.	5	MH	169	Bus. Math w/Cal. App.	5
		Science**	5			Science**	5	PG	211	Psychology	5
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3
		HY/AT/EH***	3			HY/AT/EH***	3			HY/AT/EH***	3
		ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1
			SOPHOMORE YEAR								
EC	200	Economics I	5	EC	202	Economics II	5	SC	211	Public Speaking	5
ACF	211	Intr. Acct. I†	4	MN	274	Statistics I	5	MT	255	Legal & Soc. Environ.	4
MN	207	Intr. Computer Prog.	3	ACF	212	Intr. Acct. II	4	EHA	315	B & P Report Writing	3
		Elective†	3			Elective††	3			Elective†††	4
		ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1

*Students may take MH 160 instead. Credit is not allowed for both MH 140 and MH 160.

**Ten hours of Science are required to be selected from any of the following courses: BI 105 and 106 or 107 or 108; CH 101-102-104 or CH 103-104; GL 101-102-103 or 110-103; PHS 100-101; PS 205-206-207. Credit will not be given for both PHS 100 and PS 200, 205, or 220.

***Students may take any combination of World History, HY 101-102-103, Technology and Civilization, HY 204-205-206, History of Art, AT 171-172-173, and Western World Literature, EH 260-261-262.

†Students planning to enter the Accounting Option should take ACF 211 and ACF 212 during the second and third quarters of their sophomore year.

[Electives may be from any area, subject to departmental requirements. During the four years of study a minimum of 40 percent of all hours required for graduation must be taken in Business and Economics and a minimum of 40 percent in non-business subjects.

Students planning to take Industrial/Operations Management (IOM) should take their Industrial Engineering & Textile Engineering electives during their sophomore year.

Accounting and Finance students are encouraged to take PA 111 (Basic Reasoning) as an elective. Students planning to major in Marketing or Transportation are encouraged to take PA 111 and PA 211 (Introduction to Deductive Logic).

††Students who have not taken typewriting in high school are strongly encouraged to take VED 200. For the Office Administration curriculum, in the School of Education, see page

†††Students in the Management and Personnel Management and Industrial Relations options take SY 201.

Department of Accounting and Finance

Accounting (AC)

A sound knowledge of the fundamentals of accounting is essential to success in any economic endeavor. Accounting is the language of business, and accounting procedures and records are the basic ingredients for sound management decision-making in both business and non-business organizations, including public and philanthropic bodies. Financial reports are required by the Securities and Exchange Commission with the sale of stocks and bonds which form the capital structure of our economic society. They are the basis for determining income taxes due federal and state governments.

The Professional Option Program in Accounting develops the student's ability to work effectively, to exercise mental discipline and to communicate orally and in writing. The student gains an appreciation of the accountant's high standard of integrity and objectivity in reporting and an awareness of the responsibility for self-education upon entering an accounting career. The accounting curriculum includes sufficient elective courses to serve students intending careers in public, in industrial, and in governmental accounting.

The Professional Option Program in Accounting is intended to attract to accounting careers those students who seem to possess the potential for making a contribution to the advancement of accounting and who have the aptitude which indicates a reasonable chance for a successful career.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

JUNIOR YEAR

Second Quarter

First Quarter			Second Quarter			Third Quarter		
ACF	311	Inter. Acct. I.....5	ACF	312	Inter Acct. II.....5	ACF	313	Inter Acct. III.....5
MT	331	Prin. of Mkt.....5	MN	346	Org. Behavior.....4	ACF	314	Income Tax.....5
ACF	361	Prin. of Finance.....5	MN	380	Prin. Op. Mgt.....4	ACF	319	Bus. Law for Acct.....5
MN	310	Prin. of Mgt.....4			Elective**.....4			

SENIOR YEAR

ACF	410	Cost Acctng.....5	ACF	517	Adv. Mgt. Acct.....5	ACF	416	Auditing.....5
ACF	415	Acct. Systems.....5	MN	480	Bus. Policies.....5			Acct. Elective.....5
EHA	415	Written Bus. Comm.....3			Acct. Elective.....5			Elective**.....5-3
		Elective**.....5						Humanities Elective*3-5

TOTAL — 203 QUARTER HOURS

*To be chosen from Anthropology, Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

**Accounting majors are encouraged to take MN 307, 583, and ACF 363 as elective courses.

Finance (FI)

The influence and the responsibilities of financial executives have been expanding dramatically in recent years. Financial officers are involved in the most profound decisions affecting the strategy of business operations. They decide to expand, merge, contract, and change. They are concerned not only with the pricing of products, but with the initial decision to produce them. All aspects of business affairs ultimately reduce to dollar terms, and the financial officers' intimate knowledge of the intricacies of financial operations place them in a vital role in corporate management.

The Professional Option Program in Finance offers students an opportunity to specialize in personal and institutional finance. Courses in real estate and insurance are available.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

First Quarter			JUNIOR YEAR			Third Quarter		
			Second Quarter					
ACF	361	Prin. of Finance5	ACF	311	Inter. Acct. I5	ACF	312	Inter. Acct. II5
ACF	213	Mgt. Cost & Bdgt.4	ACF	367	Money Mkts. &5	ACF	484	Investments5
MN	310	Prin. of Mgt.4			Fin. Inst.5	MN	382	Mgt. Info. Systems . . .4
MT	331	Prin. of Mkt.5	MN	346	Org. Behavior4			Elective3
			MN	380	Prin. Op. Mgt.4			
			SENIOR YEAR					
ACF	363	Adv. Bus. Finance5			Fin. Elective5	MN	480	Bus. Policies5
EHA	415	Written Bus. Comm. . . .3			Humanities5			Dept. Elective5
		Fin. Elective5			Elective*3-5			Elective5
		Elective3			Elective5-3			
					Elective5			

TOTAL — 204 QUARTER HOURS

Electives should be chosen in consultation with the adviser. See catalog course descriptions.

*To be chosen from Anthropology, Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

International Business (IB)

The demand for managers trained in both foreign language and business principles is growing at an accelerated pace. The International Business Option provides the student with the opportunity to develop analytical and decision making skills necessary for effective participation in the global challenge facing American business today. The curriculum is designed to emphasize the additional risks encountered by international business firms and to enable the student to acquire proficiency in a foreign language including specialized business terminology. (See also Foreign Languages — International Trade Major in the School of Arts and Sciences.)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
EH	101	English Comp.3	EH	102	English Comp.3	EH	103	English Comp.3
HY/EH/AT		. . . . .3	HY/EH/AT		. . . . .3	HY/EH/AT		. . . . .3
MH	140	College Algebra5	MH	161	Anal. Geo. & Cal.5	MH	169	Bus. Math. w/Cal. App. 5
FL		Foreign Language* . . .5	FL		. . . . .5	FL		. . . . .5

SOPHOMORE YEAR

MN	207	Intr. Computer Prg. . . .3	ACF	211	Intr. Acct. I4	ACF	212	Intr. Acct. II4
EC	200	Econ. I5	EC	202	Econ. II5	MT	255	Leg & Soc. Env.4
FL		. . . . .5	MN	274	Statistics I5	FL		. . . . .5
PG	211	Psychology5	FL		. . . . .5	SY	201	Sociology5

JUNIOR YEAR

MT	331	Prin. of Mktg.5	MN	346	Org. Behavior4	ACF	361	Prin. of Fin.5
MN	310	Prin. of Mgmt.4	MN	380	Prin. of Opr. Mgmt. . .4	MT	341	Buyer Behavior5
FL	321/331/351	Conv. Lg.3			Science5	FL		Civilization***3
		Science5	FL	322/332/352	Comp.3	EC	571	Int'l Econ.5

SENIOR YEAR

MN	382	Mgt. Info. Sys.4	MN	410	Int'l Mgmt.5	MN	480	Bus. Policies5
		Bus. Elective**5	FL	329/339/359	Bans Lg.3			Approv. Gy Course . .5
		Elective5			Approv. HY Course . .5	MT	440	Int'l Mktg.5
		Elective3	ACF	451	Multinat'l Fin. Mgt. . .5	FL	520/430/450	FL Int. Td.3

TOTAL — 207 QUARTER HOURS

Approved History Courses HY 300, 301, 306, 354, 355, 356, 516, 533, 537, 550, 552, 554, 555, 557.

Approved Geography Courses GY 304, 306, 307, 308, 350, 401, depending on area of language specialization and interest.

*Language sequence to be taken exclusively in French, Spanish or German.

**A minimum of 5 hours to be chosen from School of Business courses at the 300 or above level.

***One required civilization course depending on area of language specialization; French FL 323; German FL 353; Spanish FL 333, 334, 335, 336 or 337.

Department of Economics

Business Economics (EC)

Economic understanding is the foundation of effective managerial decision-making. The Business Economics Professional Option provides students with the critical awareness and analytical capacity needed to succeed in managerial and administrative positions, whether in the private or public sector. The Business Economics curriculum provides maximum flexibility and broad-based preparation for future employment opportunities. Graduates are prepared for entry-level positions in many areas of business activity. In addition, the Economics Option provides excellent preparation for graduate or professional studies. (See also Economics Major in the College of Arts and Sciences.)

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

First Quarter			JUNIOR YEAR			Third Quarter		
			Second Quarter					
ACF	361	Prin. of Finance5	EC	556	Inter. Macroeconomics5	MT	331	Prin. of Mkt.5
EC	551	Inter. Microeconomics5	MN	346	Org. Behavior4			Humanities Elective* . . .5
MN	310	Prin. Mgt.4			Humanities Elective*5-3			Dept. Elective5
		Humanities Elective*3-5			Elective3			Elective3
			SENIOR YEAR					
EHA	415	Written Bus. Comm. . . .3	EC	554	Hist. Ec. Thought5	MN	480	Bus. Policies5
MN	380	Prin. Oper. Mgt.4	MN	382	Mgt. Info. Sys.4			Dept. Elective5
		Dept. Elective5			Dept. Elective5			Elective5
		Dept. Elective5						

TOTAL — 200 QUARTER HOURS

Economics departmental electives are any EC designated courses except EC 206.

*To be selected from Anthropology, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

Department of Management

The success or failure of any business is dependent upon the quality of its management. Business managers must acquire and effectively utilize physical, financial, and human resources to ensure an organization's survival and development. In order to make sound decisions, the manager must be knowledgeable in basic business functions as well as the process of management.

The professional options within the Management Department are designed to impart knowledge which will assist future managers to be good decision makers for their organizations.

General Business — Theatre (GBT)

The General Business-Theatre Professional Option is an interdepartmental program between the Management Department and the Department of Theatre which is administered by the School of Business. It permits students who wish to work in professional theatre to be well grounded in business management and thus able to utilize business skills while developing their theatrical careers.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH	140	College Algebra.....5	MH	161	Anal. Geo. & Cal.....5	MH	169	Bus. Math w/Cal.
		Science.....5			Science.....5			App.....5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
TH	231	Theatre Tech. I.....4	TH	101	Intr. to Theatre.....3	TH	200	Intr. to Act. & Dir.....4
TH	300	Theatre Lab.....1	TH	300	Theatre Lab.....1	TH	261	Costume Constr.....4
TH	100	Theatre Convo.....0	TH	100	Theatre Convo.....0	TH	300	Theatre Lab.....1
						TH	100	Theatre Convo.....0

SOPHOMORE YEAR

EC	200	Economics I.....5	EC	202	Economics II.....5	SC	211	Pub. Speaking.....5
MN	207	Intr. Computer Prog.....3	MN	274	Bus. & Ec. Statistics.....5	ACF	212	Prin. of Acct. II.....4
PG	212	Psychology.....5	ACF	211	Prin. of Acct. I.....4	EHA	315	Report Writing.....3
TH	240	Theatrical Design.....4	TH	271	Play Analysis.....4	TH	371	Hist. of Theatre I.....3
TH	300	Theatre Lab.....1	TH	300	Theatre Lab.....1	TH	300	Theatre Lab.....1
TH	100	Theatre Convo.....0	TH	100	Theatre Convo.....0	TH	100	Theatre Convo.....0

JUNIOR YEAR

MT	331	Prin. of Mkt.....5	MN	346	Org. Behavior.....4	ACF	361	Prin. of Finance.....5
ACF	213	Mgt. Cost & Budg.....4	MN	380	Prin. Op. Mgt.....4	MT	255	Leg. & Soc. Env.....4
MN	310	Prin. of Mgt.....4	TH	265	Stage Makeup.....3	TH	373	Hist. of Theatre III.....3
TH	372	Hist. of Theatre II.....3	TH	300	Theatre Lab.....1	TH	300	Theatre Lab.....1
TH	300	Theatre Lab.....1	TH	405	Theat. Op./Mgt.....4			Theatre Elective.....4
TH	100	Theatre Convo.....0	TH	100	Theatre Convo.....0	TH	100	Theatre Convo.....0

SENIOR YEAR

MN	442	Personnel Mgt.....4	EHA	415	Writ Bus. Comm.....3	MN	480	Bus. Policies.....5
MN	382	Mgt. Info. Systems.....4	TH	300	Theatre Lab.....1	TH	300	Theatre Lab.....1
TH	321	Directing: Fund.....4	TH	100	Theatre Convo.....0	TH	100	Theatre Convo.....0
TH	374	Hist. of Theatre IV.....3			Business Elective*.....5			Theatre Elective.....4
TH	300	Theatre Lab.....1			Business Elective*.....5			Elective.....3
TH	100	Theatre Convo.....0			Theatre Elective.....4			
		Business Elective*.....4						

TOTAL — 206 QUARTER HOURS

*Business electives must be selected from the 300, 400 or specified 500-level course offerings of the School of Business.

Industrial/Operations Management (IOM)

The Industrial/Operations Management Professional Option prepares students for a broad range of managerial and staff positions in business. The functional, behavioral, economic and legal aspects of various types of business organizations are studied, utilizing a variety of analytical and conceptual models, tools, and techniques. Electives may be utilized to provide an emphasis in the area of computer information systems, materials management, operations management or forest products. Details concerning these emphases are available in the Management Department or Student Affairs Office in the School of Business.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

JUNIOR YEAR

First Quarter			Second Quarter			Third Quarter		
MT	331	Prin. of Mkt.....5	ACF	361	Prin. of Fin.....5	MN	381	Mgt. D.M.....5
ACF	213	Mgt. Cost & Budg.....4	MN	346	Org. Behavior.....4	MN	385	Prod. Mgt.....5
MN	310	Prin. of Mgt.....4	MN	380	Prin. Op. Mgt.....4			Approved Elective**.....5
IE	100	Intr. Mfg. Proc.....2	IE	or	TE Elective.....1	IE	or	TE Elective*.....1
		Elective.....3			Elective.....3			

SENIOR YEAR

MN	500	Labor Relations.....5	EHA	415	Written Bus. Comm.....3	MN	480	Bus. Policies.....5
MN	382	Mgt. Info. System.....4	MN	387	MtIs. Mgt. II.....5	MN	484	Adv. Oper. Mgt.....5
MN	386	MtIs. Mgt. I.....5	MN	420	Indus. Procurement.....5			Approved Elective**.....5
MN	474	Quality Assurance.....3			Approved Elective**.....5			Elective.....3

TOTAL — 206 QUARTER HOURS

*To be selected from IE 102, 111, 112, 113, 114, 115 or TE 101.

**A minimum of 15 hours of approved electives must be selected from an approved list in the School of Business Student Affairs Office.

Management (MN)

The "Management" Professional Option prepares students to assume managerial and staff responsibilities in business, government and non-profit organizations. Emphasis is on broad management training rather than specialization in a particular industry or functional area. It is an opportunity-oriented program designed for students who wish to develop career flexibility. Students completing this option should have the background necessary for employment in a wide variety of professional positions. Students should take SY 201 for 5 of their elective hours in Pre-Business.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

JUNIOR YEAR

Second Quarter

MT	331	Prin. of Mkt.	5	ACF	361	Prin. of Finance	5	ACF		Third Quarter		
ACF	213	Mgt. Cost & Bdg.	4	MN	346	Org. Behavior	4			Finance Elective*	5	
MN	310	Prin. of Mgt.	4	MN	380	Prin. of Oper. Mgt.	4	MT	241	Quant. Elective*	5	
		Econ. Elective*	5			Desig. Elective*	5			Business Law I	4	
										Desig. Elective*	3	

SENIOR YEAR

		Int'l. Elective*	5	MT		Mkt. Elective*	5	MN	480	Bus. Policies	5	
MN	382	Mgt. Info. Sys.	4	EHA	415	Written Bus. Comm.	3	MN		Mgt. Elective*	5	
MN	442	Personnel Mgt.	4	MN		Mgt. Elective*	5			Business Elective*	5	
MT		Mkt. Elective*	5	ACF		Finance Elective*	5					

TOTAL — 206 QUARTER HOURS

*Electives must be selected from an approved list in the School of Business Office of Student Affairs.

Personnel Management and Industrial Relations (PIR)

The Personnel Management and Industrial Relations Program prepares students for managing personnel and industrial relations activities. It blends a variety of subject matter into decision-making patterns that may be used to work with individual employees and unions. In addition, the program provides some free electives. Students should take SY 201 for five of their elective hours in Pre-Business.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

JUNIOR YEAR

MT	331	Prin. of Mkt.	5	ACF	361	Prin. of Finance	5	MN	500	Labor Relat.	5	
EC	350	Labor Economics	5	MN	442	Personnel Mgt.	4	MN	382	Mgt. Info. Sys.	4	
MN	310	Prin. of Mgt.	4	MN	346	Org. Behavior	4	MN	541	Pers. Organ. Res. I	4	
		Elective	4	MN	380	Prin. Op. Mgt.	4			Elective	5	

SENIOR YEAR

MN	501	Labor Rel. Law	5	MN	447	Employee Comp.	4	MN	480	Bus. Policies	5	
MN	545	Pers. Organ. Res. II	3	MN	502	Labor-Mgt. Negot.	4	MN	503	Labor Arbitrat.	3	
MN	546	Pers. Adm. Leg.	4	MN	551	Manpower Plan	3	MN	550	Pers. Selec. & Pl.	3	
		Dept. Elective*	5	EHA	415	Written Bus. Comm.	3			Dept. Elective*	5	
						Elective	3					

TOTAL — 206 QUARTER HOURS

*Departmental Electives must be selected from the 300, 400 or specified 500-level course offerings of the Department of Management, or from PO 515, 517; PG 431, 515, 516, 561, 562, 563.

Department of Marketing and Transportation

The fields of Marketing and of Transportation and Physical Distribution are critical in the effective operation of business in the free world. Students gain the foundation to understand the entire corporate philosophy which affects every phase of the business programs — from initial product conception to the delivery of satisfaction to the final customer. Marketing majors discover the interrelationship of marketing to other management tools and prepare themselves for executive/managerial careers involving functional areas such as personal selling, advertising, channel and product decision-making, pricing, retailing, and strategic market planning. Transportation and Physical Distribution majors complete a course of study which prepares them for careers in carrier, physical distribution, and industrial traffic management and for assignments in regulating agency administration, in urban transportation and development planning, and as traffic and transportation specialists.

Marketing (MK)

FRESHMAN AND SOPHOMORE YEARS (See Pre-Business Program)

First Quarter			JUNIOR YEAR			Third Quarter		
			Second Quarter					
ACF	361	Prin. of Finance5	MT	336	Quan. Anal. Mkt.5	MT	436	Mkt. Research5
MT	331	Prin. of Marketing5	MT	341	Buyer Behavior5	MN	346	Org. Behavior4
MN	310	Prin. of Mgt.4	MN	380	Prin. of Oper. Mgt.4	MN	382	Mgt. Info. Syst.4
		Elective5			Elective5			Humanities
								Electives*3-5
			SENIOR YEAR					
EHA	415	Written Bus. Comm.3	MN	480	Business Policies5	MT	498	Marketing Strategy5
		Dept. Elective†5			Dept. Elective†5			Elective5
		Elective5-3			Elective5			Elective5
		Dept. Elective†5			Elective2			

TOTAL — 206 QUARTER HOURS

Transportation and Physical Distribution (TN)

FRESHMAN AND SOPHOMORE YEARS (See Pre-Business Program)

First Quarter			JUNIOR YEAR			Third Quarter		
			Second Quarter					
MT	372	Eco. of Transp.5	MT	475	Transp. Reg. Ind.5	MT	473	Phys. Dist. Mgt.5
MN	310	Prin. of Mgt.4	MN	380	Prin. Oper. Mgt.4	MN	346	Org. Behavior4
MT	331	Prin. of Mkt.5	ACF	361	Prin. of Finance5	MN	382	Mgt. Info. Sys.4
		Elective5	MT	336	Quan. Anal. Mkt.5	MT	341	Buyer Behavior5
			SENIOR YEAR					
EHA	415	Written Bus. Comm.3	MT	476	Transp. Ent. Mgt.5	MN	480	Business Policies5
		Dept. Elective†5			Directed Elective†5			Directed Elective†5
		Elective5-3			Dept. Elective†5			Elective5
		Humanities			Elective2			
		Electives*3-5						

TOTAL — 206 QUARTER HOURS

†Departmental Electives may be chosen from the following lists according to student career goals:

Marketing: MT 432, 433, 434, 437, 438, 440, 470, 477, 581, 582, 583, (managerially oriented courses).

Transportation and Physical Distribution: MT 337, 434, 437, 438, 440, 474, 477, 484.

‡Directed Electives may be chosen from business or non-business courses according to career goals upon approval of departmental advisers.

*To be chosen from Anthropology, Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

School of Education

JACK E. BLACKBURN, *Dean*
 J. BOYD SCEBRA, *Associate Dean*
 VIRGINIA HAYES, *Associate Dean*
 TRUMAN M. PIERCE, *Dean Emeritus*

THE SCHOOL OF EDUCATION is accredited by the National Council for Accreditation of Teacher Education for the preparation of teachers and school service personnel with the doctor's degree as the highest degree approved.

Emphasis in all programs is upon the preparation of personnel who will be able to meet successfully the performance demands of the roles they assume in their professional positions. An effort is made through processes of Continuous Program Renewal to revise constantly programs based upon systematic evaluative-feedback data secured on the performance of graduates on the job.

Undergraduate Curricula

Teaching and non-teaching programs are offered through the School of Education. Teaching programs are presented first, followed by non-teaching programs.

The following requirements apply to students pursuing a teacher education curriculum. A total of 210 quarter hours is required to complete the program which leads to the degree of Bachelor of Science in Education and Bachelor of Music Education.

Scholastic Requirements

The Selective Admission and Retention Program in Teacher Education — In recognition of responsibilities to the schools in which its graduates teach, the School maintains a program of selective admission and retention of candidates for the teaching profession. This program is designed to assure that no candidates are recommended for admission to the Teacher Education Program, the professional internship or certification unless they are deemed competent in their University studies and professional performance.

The students must submit a formal written application for admission to Teacher Education after completing at least 90 quarter hours (60 semester hours) of work, usually at the end of the sophomore year. Transfer students must submit the application after completing at least 12 quarter hours (nine semester hours) at Auburn University. Criteria for admission are:

- (1) a minimum grade point average of at least 2.2 (on a four point scale) on all college work attempted during the previous 90 quarter hours;
- (2) satisfactory performance on a written and spoken English language competency examination;
- (3) satisfactory performance in an interview examining personality, interests, and aptitudes consistent with the requirements for successful teaching;
- (4) a score of at least 16 on the ACT test, which cannot be more than five years old; or a combined score of at least 745 on the SAT, which cannot be more than five years old; and
- (5) successful performance in the pre-professional field experience.

Students who fail to meet these criteria upon initial application may submit new evidence in an effort to satisfy any and/or all of the above standards.

Any exception to these criteria must be approved by the Dean of the School of Education.

While retention in the Teacher Education Program is based on the continuous evaluation of the students, a formal evaluation takes place as a prerequisite for admission to the professional internship. Requirements for admission to the professional internship are:

- (1) admission to the Teacher Education Program;
- (2) completion of appropriate courses in the area of specialization;
- (3) a grade point average of 2.2 or above on all courses attempted in each of the following: professional teacher education, the teaching major, and the teaching minor; and
- (4) demonstrated potential for teaching.

In addition, in order to be eligible for graduation with teacher certification, the students will be expected to complete the requirements identified above, to demonstrate readiness to teach through on-the-job performance, and to achieve a satisfactory score on a comprehensive examination.

Persons with degrees other than in education may make application for study in a curriculum leading to professional certification, but they will be required to complete the above standards in order to qualify for certification.

Applications and specific information about the criteria of selection for admission to teacher education are available from the Teacher Education Services Office in Haley Center 3464.

Program Options, Teaching

The following Table shows program options available in the School of Education. Some programs are composite, or single major programs; some programs require two teaching majors.

Undergraduate Programs in Education

	Grade Levels				2nd Major Required	
	N-3	1-6	4-8	7-12	N-12	Yes No
Early Childhood	X					X
Elementary Education		X				X
French			X	X		X
German				X		X
Spanish			X			X
Language Arts (composite)			X	X		X
English			X			X
Journalism				X		X
Marketing & Distributive Ed.						X
Mathematics (composite)			X	X		X
Mathematics			X			X
General Science (composite)				X		X
Biology						X
Chemistry				X		X
Physics				X		X
Social Science (composite)			X	X		X
Economics						X
Geography						X
History			X			X
Political Science				X		X
Psychology				X		X
Sociology						X
Agribusiness						X
Business & Office				X		X
Health Occupations				X		X
Home Economics			X			X
Trade & Industrial				X		X
Art					X	X
Health Education		x-N-6-x			X	X
Health Education			X	X		X
Physical Education		x-N-6-x			X	X
Physical Education			X	X		X
Industrial Arts					X	X
Music, Instrumental					X	X
Vocal/Choral					X	X
General		X	-N-9-x			X
Speech/Theatre					X	X
ECE-Handicapped	X					X
Emotionally Conflicted					X	X
Mentally Retarded					X	X
Speech Pathology					X	X

Requirements for Fields of Specialization

Requirements are listed below for the teaching fields. Curriculum check lists are available in the Office of Teacher Education Services, 3464 Haley Center.

Courses in the first section are required in all Teacher Education Programs in the School of Education.

Required In All Teacher Education Programs In Education

Common Requirements:

Humanistic and Behavioral Studies: 20 Hrs. IED 101 Career Exploration or — 102 Orientation (1); FED 300 Educational Psychology (5); CED 322 Human Relations Training in Teacher Education (2); FED 350 Cultural Foundations of Education (5); EDL 401 Organization and Support of Public Education (2); RSE 376 Survey of Exceptionality (5).

Evaluation of Teaching and Learning: 5 Hrs. FED 400 Measurement and Evaluation in Education (5).

Internship: 15 Hrs. — 425 Internship (15).

Additional Requirements in Each Program in Education

EARLY CHILDHOOD, N-3

Common Requirements (40). See above.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); MU 371 Introduction to Music (3); Approved Speech (3-5); Approved Humanities* Electives (0-2).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101, 102, 103 World History or HY 204, 205, 206 Technology and Civilization (9); Approved Social Science Electives* (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 105 Perspectives in Biology (5); MH 281, 282 Elementary Mathematics (10); PHS 101 or 102 Physical Science (5).

Electives from Above: 10 Hrs. Approved Electives* from two of above areas (10).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Approved Electives* (16).

Curriculum and Teaching and Media: 22 Hrs. EM 200 Educational Media (2); CTC 320 Early Childhood Curriculum I (10); CTC 420 Early Childhood Curriculum II (10).

Reading: 10 Hrs. CTR 370, 371 Fundamentals of Reading Instruction I and II (10).

Area of Specialization: 41 Hrs. HPE 211 Sensorimotor Activities (3); HED 394 Elementary School Health (3); AT 301 Elementary School Art (5); EM 510 Media for Children (4); CD 450 Principles of Speech-Language Pathology (5); CTM 304 Music and Related Arts (5); TH 305 Creative Dramatics (3); FCD 270 Structure and Function of Family (4); CTC 440 Human resources in the Educative Process or FCD 467 Parent Education (4); FCD 301 Human Development III (5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

ELEMENTARY 1-6

Common Requirements (40). See above.

Humanities and Fine Arts: 24 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (9); MU 371 Introduction to Music (3); SC 211 or SC 273 (3-5).

Social Sciences: 24 Hrs. EC 200 Economics (5); HY 101, 102, 103 World History or HY 204, 205, 206 Technology & Civilization (9); GY 102 (5); Approved Social Science Electives* (5).

Natural and Physical Science and Mathematics: 25 Hrs. BI 105 Perspectives in Biology (5); PHS 100 and PHS 101 Physical Science (10); MH 281, 282 Elementary Mathematics (10).

Electives from Above: 10 Hrs. Approved Electives* from Humanities or Social Sciences (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 13 Hrs. Approved Electives* (13).

Curriculum and Teaching and Media: 22 Hrs. EM 200 Educational Media (2); CTE 302 Curriculum I, Language (5); CTE 303 Curriculum I, Social Science (5); CTE 402 Curriculum II, Mathematics (5); CTE 403 Curriculum II, Natural Science (5).

Reading: 10 Hrs. CTR 370, 371 Fundamentals of Reading Instruction I and II (10).

Area of Specialization: 40 Hrs. HED 394 Elementary School Health (3); PED 212 Elementary School Activities (3); AT 301 Elementary School Art (5); EM 510 Media for Children (4); CD 450 Principles of Speech-Language Pathology (5); CTM 304 Music and Related Arts (5); Approved Electives* (15).

Required Concentration (20)

*See Departmental Adviser for Approval of Electives prior to enrolling.

FRENCH, 4-8

Common Requirements (40). See above.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU and/or TH (1-3); Humanities Elective from FL, or second major when possible (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Science Electives* (6); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology and Civilization (9).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective from MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. FL Elective (5); Elective from Social Science, Natural Science, Physical Science or Mathematics (see 2nd major) (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Free; may be from 2nd major and/or FL (16).

Curriculum and Teaching and Media: 13-19 Hrs. EM 200 Educational Media (2); CTD 419 The Middle School (5); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); Teaching and Program in 2nd major (0-6)

Reading: 10 Hrs. CTR 370 Fundamentals of Reading Instruction I (5); CTR 571 Reading in the Content Area (5)

Area of Specialization: 48 Hrs. FL 121, 122, 123 First Year French (15); FL 221, 222, 223 Second Year French (15); FL 321 Conversation (3); FL 322 Composition (3); FL 323 Civilization (3); FL 324 Phonetics and Diction and/or 325 and/or 326 Survey of French Literature (6); FL Elective, 300 Level or above (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

FRENCH 7-12

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Elective in FL or 2nd major (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology & Civilization (9); Social Science Elective from ANT, AT 171, 172, 173 Art History, EC, GY, HY, PO, PG, SY (6)

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective, MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. FL from Area of Specialization (5); Social Science or Mathematics or Science Elective from above — selected from 2nd major when possible (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Electives (16). May be from FL or 2nd Major.

Curriculum and Teaching and Media: 13-19 Hrs. EM 200 Educational Media (2); CTS 420 The Secondary School (5); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); Teaching & Program in 2nd Major (0-6).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 48 Hrs. FL 121, 122, 123 First Year French (15); FL 221, 222, 223 Second Year French (15); FL 321 Conversation (3); FL 322 Composition (3); FL 323 Civilization (3); FL 324 Phonetics and Diction and/or 325 and/or 326 Survey of French Literature (6); Approved Electives* in French (3).

*See Department Adviser for Approval of Electives prior to enrolling.

GERMAN, 7-12

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Elective in FL or 2nd major (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology & Civilization (9); Social Science Elective from ANT, AT 171, 172, 173 Art History; EC, GY, HY, PO, PG, SY (6)

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective, MH (5); Mathematics or Science Elective from above (5)

Electives from Above: 10 Hrs. FL from Area of Specialization (5); Social Science or Mathematics or Science Elective from above — selected from 2nd major when possible (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Electives (16); May be from Area of Specialization or 2nd Major.

Curriculum and Teaching and Media: 13-19 Hrs. EM 200 Educational Media (2); CTS 420 The Secondary School (5); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); Teaching & Program in 2nd Major (0-6).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 48 Hrs. FL 151, 152, 153 First Year German (15); FL 251, 252, 253 Second Year German (15); FL 351 Conversation & Phonetics (3); FL 352 Composition (3); FL 353 Civilization (3); Approved German Literature (6); Approved Electives* in German (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

SPANISH, 4-8

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU and/or TH (1-3); Humanities Elective from FL, or second major (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Science Electives* (6); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology and Civilization (9).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective from MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. FL Elective (5); Elective from Social Science, Natural Science, Physical Science or Mathematics (see 2nd major) (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. May be from FL or 2nd major (16).

Curriculum and Teaching and Media: 13-19 Hrs. EM 200 Educational Media (2); CTD 419 The Middle School (5); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); Teaching and Program in 2nd major (0-6).

Reading: 10 Hrs. CTR 370 Fundamentals of Reading Instruction I (5); CTR 571 Reading in the Content Area (5)
Area of Specialization: 48 Hrs. FL 131, 132, 133 First Year Spanish (15); FL 231, 232, 233 Second Year Spanish (15); FL 331 Conversation & Phonetics (3); FL 332 Composition (3); Spanish Civilization or Spanish American Civilization and/or Spanish Literature (9); FL Elective, 300 Level or Above (3)

*See Departmental Adviser for Approval of Electives prior to enrolling.

SPANISH, 7-12

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Elective in FL or 2nd major (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206; World History or Technology and Civilization (9); Social Science Elective from ANT, AT 171, 172, 173 Art History; EC; GY; HY; PO; PG; SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective, MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. FL from Area of Specialization (5); Social Science or Mathematics or Science Elective from above — selected from 2nd major when possible (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Electives (16); May be from Area of Specialization or 2nd major.

Curriculum and Teaching and Media: 13-19 Hrs. EM 200 Educational Media (2); CTS 420 The Secondary School (5); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); Teaching and Program in 2nd major (0-6).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 48 Hrs. FL 131, 132, 133 First Year Spanish (15); FL 231, 232, 233 Second Year Spanish (15); FL 331 Conversation & Phonetics (3); FL 332 Composition (3); Spanish Civilization or Spanish/American Civilization and/or Spanish Literature (9); Approved Electives* in Spanish (3)

*See Departmental Adviser for Approval of Electives prior to enrolling.

LANGUAGE ARTS, 7-9 (Composite)

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved TH (3); Approved Literature* (3); Approved Humanities Elective* from TH, EH, AT, MU, SC, RL, PA, FL (5).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101, 102, 103 or 204, 205, 206 World History or Technology & Civilization (9); Approved Social Science Electives* from GY, HY, PO, SY, EC, PG, ANT (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective from MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. Humanities Elective from above (5); Social Science or Science or Mathematics Elective (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Electives. May be from Area of Specialization or second major. (16).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); CTD 419 The Middle School (5); CTS 411, 412, 413 Teaching English (9).

Reading: 10 Hrs. CTR 370 Fundamentals of Reading Instruction I (5); CTR 571 Reading in the Content Area (5).

Area of Specialization: 80 Hrs. CTS 501 Language Study for Teachers (5); CTS 502 Rhetoric & Composition for Teachers (5); CTR 576 Reading of Adolescents (5); EH 390 Advanced Composition (5); EH 357 or 358 American Literature (5) or any two from EH 270, 271, 272 (6); EH 253 or 254 or 255 English Literature (3); EH 260 or 261 or 262 World Lit. (3); Electives in EH (13); Electives in SC (6); Electives in TH (8). **

*See Departmental Adviser for Approval of Electives prior to enrolling.

**Electives do not include Freshman composition.

LANGUAGE ARTS, 7-12 (Composite)

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective in TH (3); Humanities Elective from EH, TH, AT, FL, MU, PA, RL, or SC (5).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology & Civilization (9); Social Science Elective from ANT, EC, GY, HY, PG, PO, SY (6);

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. Humanities Elective from above (5); Social Science or Science or Mathematics Elective from above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Electives. May be from Area of Specialization. (16).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); CTS 411, 412, 413 Teaching English (9); CTS 420 The Secondary School (5).

Reading: 5 Hrs. CTR 571 Reading in the Content Area (5).

Area of Specialization: 80 Hrs. EH 357 or 358 American Literature (5) or any two from EH 270, 271, 272 (6); EH 551 or 552 Shakespeare (5); EH 390 Advanced Composition (5); CTS 501 Language Study for Teachers (5); CTS 502 Rhetoric

& Composition for Teachers (5); CTR 576 Reading of Adolescents (5); EH 393 Introduction to Linguistics or EH 541 History of the English Language, or EH 594 Mod. English Grammars (5); Approved Electives in EH* to include EH 260 or 261 or 262 (20**); Approved Electives TH* (8); Approved Electives JM*, including CTS 201 P (8); Approved Electives in JM* (4); Electives from EH, SC, TH or CTR (5). **

*See Departmental Adviser for Approval of Electives prior to enrolling.

**Electives do not include Freshman composition.

ENGLISH, 4-8

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Elective from AT, EH, MU, TH, SC, FL, RL, PA (0-2); EH from Area of Specialization (5).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology & Civilization (9); Approved Social Science Electives* from SY, PO, GY, EC, HY, PG, ANT (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective from MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. EH Elective from Area of Specialization (5); Social Science, Science or Mathematics Elective, see 2nd major (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Select from Area of Specialization or 2nd major (16).

Curriculum and Teaching and Media: 22 Hrs. EM 200 Educational Media (2); CTD 419 The Middle School (5); CTS 411, 412, 413 Teaching English (9); Program and Teaching in 2nd major (6).

Reading: 10 Hrs. CTR 370 Fundamentals of Reading Instruction I (5); CTR 571 Reading in the Content Area (5).

Area of Specialization: 40 Hrs. CTS 501 Language Study for Teachers (5); CTS 502 Rhetoric & Composition for Teachers (5); CTR 576 Reading of Adolescents (5); EH 390 Advanced Composition (5); EH 357 or 358 American Literature (5) or any two from EH 270, 271, 272 (6); EH 253 or 254 or 255 English Literature (3); EH 260 or 261 or 262 World Literature (3); Approved EH Electives* (9).

*See Departmental Adviser for Approval of Electives prior to enrolling.

ENGLISH, 7-12

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103, English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU, or TH (1-3); EH Course from Area of Specialization (5); Humanities Electives from AT, EH, FL, MU, PA, RL, SC, or TH (0-2).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology & Civilization (9); Social Science Electives from ANT, EC, GY, HY, PG, PO, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. EH Course from Area of Specialization (5); Elective from Social Science or Mathematics or Science Above — Select from 2nd major when possible (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Electives to be selected from Area of Specialization or 2nd major (16).

Curriculum and Teaching and Media: 22 Hrs. EM 200 Educational Media (2); CTS 411, 412, 413 Teaching English (9); CTS 420 The Secondary School (5); Teaching & Program in second major (6).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 40 Hrs. EH 250, 251 English Literature for Superior Students or EH 253, 254, 255 English Literature or EH 260, 261, 262 World Literature (9-10); EH 551 or 552 Shakespeare (5); EH 357 or 358 American Literature (5) or any two from EH 270, 271, 272 (6); CTS 501 Language Study for Teachers (5); CTS 502 Rhetoric & Composition for Teachers (5); Approved EH Electives (10-11). **

*See Departmental Adviser for Approval of Electives prior to enrolling.

**Electives do not include Freshman composition.

JOURNALISM, 7-12

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU, TH (1-3); Humanities Elective from AT, EH, FL, MU, PA, RL, SC, TH (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology & Civilization (9); Social Science Elective from ANT, EC, GY, HY, PG, PO, SY, Selected from 2nd major if possible (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective from MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. Humanities Elective from major 2, if possible (5); Social Science or Mathematics or Science Elective — from 2nd major if possible (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Electives (16). May be selected from Area of Specialization or 2nd major.

Curriculum and Teaching and Media: 19 Hrs. EM 200 Educational Media (2); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); Teaching & Program in 2nd major (6); CTS 420 The Secondary School (5).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 43 Hrs. EH 390 Advanced Composition (5); JM 101 Newspaper Style (3); JM 221 Newswriting (5); JM 313 Reporting (5); JM 314 Copyreading & Editing (5); JM 465 History & Principles of Journalism (5); SC 338 Broadcast Newswriting (5); CTS 495 Practicum (5); JM 421 Photo-Journalism (5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

MATHEMATICS, 4-8 (Composite)**

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Electives Selected from AT, MU, TH (1-3); Humanities Electives selected from AT, EH, FL, MU, PA, RL, SC, TH (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); Social Science Electives from ANT, AT 171, 172, 173 Art History; EC, GY, HY, PG, PO, SY (15).

Natural and Physical Science and Mathematics: 20 Hrs. BI, BY, VM, ZY (5); CH 101 or 102 or 103 Chemistry or GL 101 Introductory Geology or PS 205 Introductory Physics or PHS 100 Introductory Physical Science (5); MH 161, 162 Analytical Geometry & Calculus (10).

Electives from Above: 10 Hrs. Electives from two of three above categories: Humanities, Social Science, Science and Mathematics (10).

Health and Physical Ed.: 4 Hrs. PE Electives (2); HED 195 Health Science (2).

Electives: 16 Hrs. CTS 420 The Secondary School (5); Electives (11).

Curriculum and Teaching and Media: 20 Hrs. EM 200 Educational Media (2); CTD 401 Teaching Mathematics in the Middle School (4); CTS 402, 403 Mathematics Program & Teaching I, II (6); CTS 404 Teaching Mathematics Applications (3).

Reading: 10 Hrs. CTR 370 Fundamentals of Reading Instruction I (5); CTR 571 Reading in the Content Area (5).

Area of Specialization: 64 Hrs. MH 161, 162, 163 Analytic Geometry/Calculus (15); CTS 204 Fund. of Compr. Program (3); MH 264 Analytic Geometry/Calculus (5); MH 265 Linear Differential Equations or MH 301 History of Mathematics (3); MH 266 Linear Algebra (3); MH 331 Modern Algebra (5); MH 541 Geometry: A Modern View (5); MH 567 Mathematical Probability (5); Approved MH Electives* (10-14); Approved Electives* in one related area from CH, EC, PS, PG, MH (applied), TS, Computer Science (10-14); (Credit not allowed for MH 140, 151, 281, 282.)

*See Departmental Adviser for Approval of Electives prior to enrolling.

**Program must include one of the following 3 course sequences: AT 171, 172, 173 Art History; HY 101, 102, 103 World History; HY 204, 205, 206 Technology and Civilization; EH 260, 261, 262 World Literature (9).

MATHEMATICS, 4-8

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU, TH (1-3); Humanities Electives from AT, EH, FL, MU, PA, RL, SC, TH (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology & Civilization (9); Approved Social Science Electives* from ANT, AT 171, 172, 173, EC, GY, HY, PO, PG, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science selected from BI, BY, ZY, VM (5); Physical Science selected from PHS, CH, PS, GL, AM, AY (5); MH 161, 162 Analytic Geometry and Calculus (10).

Electives from Above: 10 Hrs. Mathematics course from Area of Specialization (5); Humanities or Social Science Elective. See 2nd major (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. May select from Area of Specialization or 2nd major (16).

Curriculum and Teaching and Media: 20 Hrs. EM 200 Educational Media (2); CTD 419 The Middle School (5) CTD 401 Teaching Mathematics in the Middle School (4); CTS 402 or 403 Programs & Teaching (3); Teaching & Programs in 2nd major (6).

Reading: 10 Hrs. CTR 370 Fundamentals of Reading Instruction I (5); CTR 571 Reading in Content Area (5).

Area of Specialization: 44 Hrs. MH 161, 162, 163 Analytic Geometry/Calculus (15); CTS 204 Fund. of Compr. Program (3); MH 264 Analytic Geometry/Calculus (5); MH 265 Linear Differential Equations or MH 301 History of Mathematics (3); MH 266 Linear Algebra (3); MH 331 Modern Algebra (5); MH 541 Geometry: A Modern View (5); MH 567 Mathematical Probability (5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

MATHEMATICS, 7-12 (Composite)**

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Electives selected from AT, MU, TH (1-3); Humanities Electives Selected from AT, EH, FL, MU, PA, RL, SC, TH (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); Social Science Electives from ANT, AT 171, 172, 173 Art History; EC, GY, HY, PG, PO, SY (15).

Natural and Physical Science and Mathematics: 20 Hrs. BI, BY, VM, ZY (5); CH 101, or 102 or 103 Chemistry or GL 101 Introductory Geology or PS 205 Introductory Physics or PHS 100 Introductory Physical Science (5); MH 161, 162 Analytical Geometry & Calculus (10).

Electives from Above: 10 Hrs. Electives from two of three above categories: Humanities, Social Science, Science and Mathematics (10).

Health and Physical Ed.: 4 Hrs. PE Electives (2); HED 195 Health Science (2).

Electives: 16 Hrs. CTS 420 The Secondary School (5); Electives (11).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); CTS 402, 403 Mathematics Program & Teaching I, II (6); CTS 404 Teaching Mathematics; Application & Techniques (3).

Reading: 5 Hrs. CTR 571 Reading in Content Area.

Area of Specialization: 72 Hrs. MH 161, 162, 163 Analytic Geometry/Calculus (15); CTS 204 Fund. of Comptr. Program. (3); MH 264 Analytic Geometry/Calculus (5); MH 265 Linear Differential Equations (3); MH 266 Linear Algebra (3); MH 301 History of Mathematics (3); MH 331 Modern Algebra (5); MH 332 Modern Algebra or MH 505 Matrix Theory or MH 515 Algebra for Applied Math or MH 537 Linear Algebra (5); MH 541 Geometry: A Modern View (5); MH 542 Geometry: A Modern View or MH 543 Linear Geometry or MH 544 Combinatorial Geometry (4); MH 567 Mathematical Probability (5). In addition students will select option 1, 2, 3 or 4: Option 1: General Mathematics/Applied Mathematics — Approved Mathematics Electives* (22); Option 2: General Mathematics/Applications and Models — Approved Mathematics Electives* (8-12); Approved Electives* in one of EC, CH, PS, PG, TS (10-14); Option 3: Mathematics/Computer Science — MH 560 Introduction to Numerical Analysis or MH 561 Numerical Matrix Analysis (5); MH 518 Analysis for Applied Math (5); CSE 200 Intr. Computers and Programming or CSE 204 Computer Programming or MH 271 Mathematical Programming (3); CSE 210 Computer Systems (3); Approved Electives in Computer Science (6); Option 4: Advanced Program: MH 520, 521, 522 Analysis I, II, III (15); MH 332 or 505 or 515 or 537 or 568 or 569.* (5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

**Program must include one of the following 3-course sequences AT 171, 172, 173 Art History; HY 101, 102, 103 World History; HY 204, 205, 206 Technology & Civilization; EH 260, 261, 262 (9).

MATHEMATICS, 7-12

Common Requirements (44). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Electives from AT, MU or TH (1-3); Humanities Electives from AT, EH, FL, MU, PA, RL, SC or TH — select from 2nd major if possible (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204; 102 or 205; 103 or 206, World History or Technology & Civilization (9); Social Science Electives from ANT, AT 171, 172, 173; EC, GY; HY; PG; PO or SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH 161, 162 Analytic Geometry & Calculus (10).

Electives from Above: 10 Hrs. MH 163 Analytic Geometry & Calculus (5); Elective from Humanities or Social Sciences above — from 2nd major if possible (5).

Health and Physical Ed.: 4 Hrs. PE Electives (2); HED 195 Health Science (2).

Electives: 16 Hrs. Electives (16). Select from Area of Specialization or 2nd Major if possible.

Curriculum and Teaching and Media: 19 Hrs. EM 200 Educational Media (2); CTS 402, 403, Curriculum & Teaching I, II (6); Programs & Teaching in 2nd major (6); CTS 420 The Secondary School (5).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 40 Hrs. MH 161, 162, 163 Analytic Geometry/Calculus (15); CTS 204 Fund. of Comptr. Program. (3); MH 264 Analytic Geometry/Calculus (5); MH 265 Linear Differential Equations or MH 301 History of Mathematics or MH 501 Calculus of Vector Functions** (3); MH 266 Linear Algebra (3); MH 331 Modern Algebra (5); MH 541 Geometry: A Modern View (5); MH 567 Mathematical Probability (5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

**Recommended for Physics Major.

GENERAL SCIENCE, 4-8 (Composite)

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Electives selected from AT, EH, FL, MU, PA, RL, SC or TH (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204; 102 or 205; 103 or 206 World History or Technology & Civilization (9); Approved Social Science Electives* from ANT, AT 171, 172, 173; EC, GY, HY, PO, PG, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); PS 205 Physics (4); GL 101 Geology (5); MH 160 or 161 Pre-Calculus/Trigonometry or Analytical Geometry/Calculus (5).

Electives from Above: 10 Hrs. Approved Elective* from Humanities or Social Science (5); CH 103 Chemistry (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. May select a science concentration.

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); CTD 419 The Middle School (5); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); CTS 415 Current Trends and Practices (3).

Reading: 10 Hrs. CTR 370 Fundamentals of Reading Instruction I (5); CTR 571 Reading in the Content Area (5).

Area of Specialization: 65 Hrs. BI 101 Principles of Biology (5); BI 102 Plant Biology (5); BI 103 Animal Biology (5); CH 103 Chemistry I (5); CH 104 Chemistry II (5); CH 207 Organic Chemistry (5); PS 205 Physics I (4); PS 206 Physics II (4); PS 215 Astronomy (5); GL 101, 102 Geology I, II (10); AM 304 Meteorology (5); Approved Science Elective* from Biology, Chemistry, Physics, Earth & Space Science (7).

*See Departmental Adviser for Approval of Electives prior to enrolling.

GENERAL SCIENCE, 7-12 (Composite)**Common Requirements (40). See page 115.**

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Elective from AT, EH, FL, MU, PA, RL, SC, or TH (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204; 102 or 205; 103 or 206 World History or Technology & Civilization (9); Social Science Electives from ANT; AT 171, 172, 173 Art History; EC, GY, HY, PG, PO, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); PS 205 Introductory Physics (5); MH 160 or 161 Pre-Calculus with Trigonometry or Analytical Geometry & Calculus (5); GL 101 Introductory Geology (5).

Electives from Above: 10 Hrs. CH 103 Fundamentals of Chemistry (5); Electives from Humanities or Social Science above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Electives (16). May select a Science Concentration.

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); CTS 415 Current Trends and Practices (3); CTS 420 The Secondary School (5).

Reading: 5 Hrs. CTS 571 Reading in the Content Area (5).

Area of Specialization: 80 Hrs. BI 101 Principles of Biology (5); BI 102 Plant Biology (5); BI Electives, 300 Level or Above (10); CH 103, 104 Fundamentals of Chemistry I, II (10); CH Electives (10); PS 205, 206, 207 Introductory Physics I, II, III (12); PS or PHS Electives (8); GL 101, 102 Introductory Geology I, II (10); Electives in Earth & Space Science 300 Level or above (10).

*See Department Adviser for Approval of Electives prior to enrolling.

BIOLOGICAL SCIENCE, 7-12**Common Requirements (40). See page 115.**

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Elective from AT, EH, FL, MU, PA, RL, SC or TH — Select from 2nd major if possible (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204; 102 or 205; 103 or 206 World History or Technology & Civilization (9); Social Science Electives from ANT; AT 171, 172, 173 Art History; EC, GY, HY, PG, PO, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); CH 103 and CH 104 Fundamentals of Chemistry (10); MH 140 or 160 or 161 College Algebra or Pre-Calculus with Trigonometry or Analytical Geometry/Calculus (5). Science Electives (5).

Electives from Above: 10 Hrs. Electives from Humanities or Social Sciences above, selected from 2nd major if possible (5); Elective* from Science (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Electives (16). May be from Area of Specialization or 2nd major.

Curriculum and Teaching and Media: 19 Hrs. EM 200 Educational Media (2); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); Teaching & Program in 2nd major (0-6); CTS 420 The Secondary School (5).

Reading: 5 Hrs. CTR 571 Reading in the Content Area (5).

Area of Specialization: 40 Hrs. BI 101 Principles of Biology (5); BI 102 Plant Biology (5); BI 103 Animal Biology (5); ZY 250 Human Anatomy (5); ZY 251 Physiology (5); ZY 300 Genetics (5); Approved Electives* from 300 level or higher ZY, BY (10).

*See Departmental Adviser for Approval of Electives prior to enrolling.

CHEMISTRY, 7-12**Common Requirements (40). See page 115.**

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Elective from AT, EH, FL, MU, PA, RL, SC or TH — Select from 2nd major if possible (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204; 102 or 205; 103 or 206 World History or Technology & Civilization (9); Social Science Electives from ANT; AT 171, 172, 173 Art History; EC, GY, HY, PG, PO, SY (6).

Natural and Physical Science and Mathematics: 22 Hrs. BI 101 Principles of Biology (5); PS 205, 206, and 207 Introductory Physics (12); MH 160 or 161 Pre-Calculus with Trigonometry or Analytical Geometry/Calculus (5).

Electives from Above: 10 Hrs. CH 103 Fundamentals of Chemistry (5); Humanities or Social Science Elective from above — Select from 2nd major if possible (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Electives (16). May be from Area of Concentration or 2nd major.

Curriculum and Teaching and Media: 13-19 Hrs. EM 200 Educational Media (2); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); Teaching & Program in 2nd major (0-6); CTS 420 The Secondary School (5).

Reading: 5 Hrs. CTR 571 Reading in the Content Area (5).

Area of Specialization: 40 Hrs. CH 103, 104, 105 Fundamentals of Chemistry (15); CH 207, 208 Organic Chemistry (10); CH 301, 302 Biochemistry (10); CH 316 Physical Chemistry (5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

PHYSICS, 7-12**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU or TH (1-3); Humanities Electives from AT, EH, FL, MU, PA, RL, SC or TH — Select from 2nd major if possible (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101 or 204; 102 or 205; 103 or 206 World History or Technology & Civilization (9); Social Science Electives from ANT; AT 171, 172, 173 Art History; EC; GY; HY; PG; PO; SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); MH 160 or 161 Pre-Calculus with Trigonometry or Analytical Geometry/Calculus (5); CH 103 Fund. of Chemistry (3); Electives* from Science (5).

Electives from Above: 10 Hrs. PS 205 Introductory Physics (4); Humanities or Social Science Electives from above — select from 2nd major if possible (6).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Electives (16). May be from Area of Specialization or 2nd major.

Curriculum and Teaching and Media: 13-19 Hrs. EM 200 Educational Media (2); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); Teaching & Program in 2nd major (0-6); CTS 420 The Secondary School (5).

Reading: 5 Hrs. CTR 571 Reading in the Content Area (5).

Area of Specialization: 40 Hrs. PS 205, 206, 207 Introductory Physics I, II, III (12); PS 215 Astronomy (5); PS 300 Electricity & Magnetism I (4); Approved Electives in PS*, PHS to include 10 hrs. 300 level or above (19).

*See Departmental Adviser for Approval of Electives prior to enrolling.

**Physics majors take second major in MH, including MH 501.

SOCIAL SCIENCE, 4-8 (Composite)**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU, TH (1-3); Humanities Electives (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Sciences* from EC, GY, HY, PQ, PG, SY in Area of Specialization (15).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective from MH (5); Mathematics or Science Elective (5).

Electives from Above: 10 Hrs. Approved Elective from Humanities* or Mathematics or Science (5); ANT or SY from Area of Specialization (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Free Electives (16).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); CTD 419 The Middle School (5); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); CTS 415 Current Trends and Practices (3).

Reading: 10 Hrs. CTR 370 Fundamentals of Reading I (5); CTR 571 Reading in the Content Area (5).

Area of Specialization: 69 Hrs. HY 101, 102, 103 World History (9); HY 506 U.S. History or HY 507 Recent U.S. History (5); HY Elective (3); PO 209 Introduction to American Government (5); PO 312 Introduction to Comparative Government (5); PO Elective (3); GY 214 Physical Geography (5); GY 215 Cultural Geography (5); EC 200 Economics (5); EC 206 Socio-Economic Foundations of Contemporary America (3); SY 201 Introductory Sociology or ANT 203 Introduction to Anthropology (5); Approved Social Science Electives* (16).

*See Departmental Adviser for Approval of Electives prior to enrolling.

SOCIAL SCIENCE, 7-12 (Composite)**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective from AT, MU, TH (3); Humanities Elective from AT, EH, FL, MU, PA, RL, SC, TH (5).

Social Science: 20 Hrs. EC 200 Economics (5); Approved Social Sciences* from Area of Specialization GY, HY, PQ, PG, SY (15).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH Elective (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. ANT 203 Introduction to Anthropology (5); Elective from Humanities or Mathematics or Science above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Free Electives (16).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); CTS 415 Current Trends and Practices (3); CTS 420 The Secondary School (5).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 80 Hrs. HY 101, 102, 103 World History (9) HY 506 U.S. History, HY 507 Recent U.S. History (5); HY 300 or HY 301 Introduction to Latin America or Introduction to Far Eastern History (5); PO 209 Introduction to American Government (5); PO 312 Introduction to comparative Government (5); PO 328 Government and the Economy or PO 329 The Presidency (3); GY 214 Physical Geography (5); GY 215 Cultural Geography (5); EC 200 Economics (5); EC 206 Socio-Economic Foundations of Contemporary America (3); PG 211 Psychology (5); SY 201 Introduction to Sociology (5); SY 202 Social Problems (5); CTS 421 Social Science Methods (5); ANT 203 Introduction to Anthropology (5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

ECONOMICS, 7-12**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, TH (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Science Electives*, ANT, GY, HY, PA, PO, SY (15).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH Elective (5); Mathematics or Science Elective from above (5); Select from 2nd Major when possible.

Electives from Above: 10 Hrs. Elective from Social Science (5); Elective from Humanities or Mathematics or Science (5); Select from 2nd major when possible.

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. American or US HY Elective (5); SY Elective (5); Free Electives (6); Select from 2nd major when possible.

Curriculum and Teaching and Media: 16-22 Hrs. EM 200 Educational Media (2); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); CTS 415 Current Trends and Practices (3); CTS 420 The Secondary School (5); Teaching & Program in 2nd major if applicable (0-6).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 45 Hrs. EC 200 Economics (5); CTS 421 Social Science Concepts (5); Approved EC Electives*, including 10 hrs. 300 level or higher (35).

*See Departmental Adviser for Approval of Electives prior to enrolling.

GEOGRAPHY, 7-12**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, TH (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Social Science Electives*, ANT, EC, PA, PG, PO, SY (15).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH Elective (5); Mathematics or Science Elective from above (5); Select from 2nd Major when possible.

Electives from Above: 10 Hrs. Elective from Social Science (5); Elective from Humanities or Mathematics or Science (5); Select from 2nd major when possible.

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. American or US HY Elective (5); SY Elective (5); Free Electives (6); Select from 2nd major when possible.

Curriculum and Teaching and Media: 16-22 Hrs. EM 200 Educational Media (2); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); CTS 415 Current Trends & Practices (3); CTS 420 The Secondary School (5); Teaching & Program in 2nd major if applicable (0-6).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 45 Hrs. GY 214 Physical Geography (5); GY 215 Cultural Geography (5); CTS 421 Social Science Concepts (5); Approved GY Electives*, including 10 hrs. 300 level or higher (30).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HISTORY, 4-8**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Elective selected from AT, MU, TH (1-3); Humanities Elective selected from AT, EH, FL, MU, PA, RL, SC, TH, select from 2nd major when possible (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); Approved Elective* from ANT, EC, GY, PA, PG, PO, SY (15).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science elective from BI, BY, ZY, VM (5); Physical Science elective from PHS, PS, CH, GL, AM, AY (5); Mathematics elective from MH (5); Mathematics or Science Elective from above (5).

Electives from Above: 10 Hrs. Elective from Social Science (5); Elective from Humanities or Science or Mathematics (5); select from 2nd major when possible.

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. HY 201 or 202 U.S. History (5); SY 201 Intro. to Sociology (5); Electives from Area of Specialization or 2nd major when possible (6).

Curriculum and Teaching and Media: 13-19 Hrs. EM 200 Educational Media (2); CTD 419 The Middle School (5); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); Teaching and Program in 2nd Major (0-6).

Reading: 10 Hrs. CTR 370 Fundamentals of Reading Instruction I (5); CTR 571 Reading in Content Area (5).

Area of Specialization: 45 Hrs. HY 101, 102, 103 World History (9); HY 201, 202 U.S. History (10); CTS 421 Social Science Concepts (5); Approved HY Electives* with 10 hours 300 level or above (21).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HISTORY, 7-12**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved Literature Elective* (3); Fine Arts Electives from AT, MU, TH (1-3); Humanities Electives from AT, EH, FL, MU, PA, RL, SC, TH (5-7).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 101, 102, 103, World History (9); Approved Social Science Electives* from ANT, EC, GY, PA, PG, PO, SY (6).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH Elective (5); Mathematics or Science Elective from above (5); Select from 2nd Major when possible.

Electives from Above: 10 Hrs. Elective from Social Science (5); Electives from Humanities or Mathematics or Science (5); Select from 2nd major when possible.

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. SY Elective (5); Free Electives (11); Select from 2nd major when possible.

Curriculum and Teaching and Media: 16-22 Hrs. EM 200 Educational Media (2); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); CTS 415 Current Trends & Practices (3); CTS 420 The Secondary School (5); Teaching & Program in 2nd major, if applicable (0-6).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 45 Hrs. HY 101, 102, 103 World History (9); HY 201, 202 U.S. History (10); CTS 421 Social Science Concepts (5); Approved HY Electives* (21); Including 10 hrs. 300 level or above.

*See Departmental Adviser for Approval of Electives prior to enrolling.

POLITICAL SCIENCE, 7-12

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, TH (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); PO 209 Amer. Govt. (5); Approved Social Science Electives*, ANT, EC, GY, PA, PG, PO, SY (10).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH Elective (5); Mathematics or Science Elective from above (5); Select from 2nd major when possible.

Electives from Above: 10 Hrs. Elective from Social Science (5); Elective from Humanities or Mathematics or Science (5); Select from 2nd major when possible.

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. American or U.S. HY Elective (5); Free Electives (11); Select from 2nd major when possible.

Curriculum and Teaching and Media: 16-22 Hrs. EM 200 Educational Media (2); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); CTS 415 Current Trends & Practices (3); CTS 420 The Secondary School (5); Teaching & Program in 2nd major if applicable (6).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 45 Hrs. PO 209 American Government (5); PO 210 State and Local Government (5); PO 312 Comparative Government (5); CTS 421 Social Science Concepts (5); Approved PO Electives* (25) including 5 hrs. 300-level or higher.

*See Department Adviser for Approval of Electives prior to enrolling.

PSYCHOLOGY, 7-12

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, TH (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Gen. Psychology (5); Approved Social Science Electives, ANT, EC, GY, PA, PG, PO, SY (10).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Electives from PHS, PS, CH, GL, AM, AY (5); MH Elective (5); Mathematics or Science Elective from above (5); Select from 2nd Major when possible.

Electives from Above: 10 Hrs. Elective from Social Science (5); Elective from Humanities or Mathematics or Science (5); Select from 2nd major when possible.

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. American or U.S. HY Elective (5); Free Electives (11); Select from 2nd major when possible.

Curriculum and Teaching and Media: 16-22 Hrs. EM 200 Educational Media (2); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); CTS 415 Current Trends & Practices (3); CTS 420 The Secondary School (5); Teaching & Program in 2nd major if applicable (0-6).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 40 Hrs. PG 211 General Psychology (5); PG 330 Social Psychology (4 or 5); CTS 421 Social Science Concepts (5); Approved PG Electives (30-31) including 6 hrs. 300 level or higher.

*See Departmental Adviser for Approval of Electives prior to enrolling.

SOCIOLOGY, 7-12

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, TH (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); SY 201 Intr. Sociology (5); Approved Social Science Electives*, ANT, GY, HY, PA, PG, PO, SY (10).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); MH Elective (5); Mathematics or Science Elective from above (5); Select from 2nd Major when possible.

Electives from Above: 10 Hrs. Elective from Social Science (5); Elective from Humanities or Mathematics or Science (5); Select from 2nd major when possible.

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. American or U.S. HY Elective (5); Free Elective (11); Select from 2nd major when possible.

Curriculum and Teaching and Media: 16-22 Hrs. EM 200 Educational Media (2); CTS 405 Teaching in Area of Specialization (3); CTS 410 Program in Area of Specialization (3); CTS 415 Current Trends & Practices (3); CTS 420 The Secondary School (5); Teaching & Program in 2nd major if applicable (0-6).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 45 Hrs. SY 201 Introduction to Sociology (5); SY 202 Social Problems (5); CTS 421 Social Science Concepts (5); Approved SY Electives* (30); Including 10 hrs. 300 level or higher.

*See Departmental Adviser for Approval of Electives prior to enrolling.

AGRIBUSINESS, 7-12

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved SC Elective* (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Electives from AT, MU, CA 116 (2). (JM 316 approved as humanities elective.)

Social Sciences: 20 Hrs. EC 200 Economics (5) or AEC 202 Ag. Economics (5); HY 103 or 206 World or Technology & Civilization (3); Approved Social Science Electives* from EC, GY, HY, PO, PG, or SY (12).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY, VM (5); CH Electives (10); MH Elective (5).

Electives from Above: 10 Hrs. Biology Elective from BI, BY, ZY (5); Social Science and/or Humanities Electives from above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. VED 346 or 541 Development/History Vocational Education (3-5); AEC 301 Agricultural Marketing (5); ADS 200 Introduction to Animal and Dairy Science (5); Free Electives (1-3).

Curriculum and Teaching and Media: 10 Hrs. EM 200 Educational Media (2); VED 414 Program in Area of Specialization (3); VED 415 Teaching in Area of Specialization (5).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 75 Hrs. ADS 200 Introduction to Animal & Dairy Science (5); HF 221 Landscape Gardening or ADS 202 Fruit & Veg. Prod. (5); AY 307 General Soils (5); AEC 301 Agricultural Marketing or AEC 202 Agricultural Economics I (5); AY 502 Economic Entomology (5); VED 408 General Shop (5); AEC 501 Farm Management (5); Poultry or Forestry Electives (5); Approved Electives* from ADS, AEC, AN, AY, FY, HF, RSY, ZY, VED to Total 75 hrs.

*See Departmental Adviser for Approval of Electives prior to enrolling.

BUSINESS EDUCATION, 7-12

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved SC Elective* (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Electives from AT, MU, CA 116 (2). (JM 315 approved as humanities elective.)

Social Sciences: 20 Hrs. EC 200, 202 Economics (10); HY 103 or 206 World/Technology & Civilization (3); Social Science Electives from EC, GY, HY, PG, PO, or SY (7).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Electives from BI, BY, ZY (10); Physical Science Elective from PHS, PS, CH, GL, AM, or AY (5); MH Elective (5).

Electives from Above: 10 Hrs. Elective from Social Science Above (5); Elective from Humanities or Science or Mathematics above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-2); HPR 195 Health Science (2-3).

Electives: 16 Hrs. VED 346 or 541 Development/History of Vocational Education (3-5); ACF 340 Personal Finance (3) or CA 323 Man the Consumer (3); Free Electives (9-10).

Curriculum and Teaching and Media: 10 Hrs. EM 200 Educational Media (2); VED 414 Program in Area of Specialization (3); VED 415 Teaching in Area of Specialization (5).

Reading: 5 Hrs. CTR 570 Reading in Content Area (5).

Area of Specialization: 75 Hrs. EC 200, 202 Economics I, II (10); VED 202 Typewriting III (3); VED 312 Shorthand III (5); ACF 211, 212 Accounting I, II (8); MN 207 Data Processing or VED 495 Practicum in Data Processing (2) or EM 370 Microcomputer Concepts and Applications in Education (5); VED 305 Records Management (3); MN 310 Principles of Management (4); ACF 340 Personal Finance (3) or CA 323 Man the Consumer (3); MT 241 Business Law I (4); VED 420 Office Machines (3); VED 422 Secretarial Procedures I (5); EH 415 Written Business Communication (3); VED 462 Directed Work Experience (5); Approved Electives* in VED, ACF, EC, MN, MT (17).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HEALTH OCCUPATIONS, 7-12

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved SC Elective* (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Electives from AT, MU, CA 116 (2). (JM 315 approved as humanities elective.)

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 103 or 206 World or Technology & Civilization (3); Social Science Electives from ANT, GY, SY, EC, HY, PA, PG, PO, RL.

Natural and Physical Science and Mathematics: 20 Hrs. CH Elective (5); Natural Science Elective from BI, BY, ZY (10); MH Elective (5).

Electives from Above: 10 Hrs. Natural Science Elective from above (5); Social Science or Humanities Elective from above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-2); HED 195 Health Science (2-3).

Electives: 16 Hrs. VED 346 or 541 Development/History Vocational Education (3-5); Approved Electives* (11-13).

Curriculum and Teaching and Media: 10 Hrs. EM 200 Educational Media (2); VED 414 Program in Area of Specialization (3); VED 415 Teaching in Area of Specialization (5).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 75 Hrs. VED 352 Medical Terminology for Health-Related Occupations (5); VED 354 Careers in Health Related Occupations (5); VED 356 Health Delivery Systems (5); VED 495 Practicum (12); VED 462 Directed Work Experience (1-15); Approved* NF Elective (3); Approved Health Science Elective* (3); Approved* FCD Elective (3-4); Approved Electives* from ANT, HED, PCS, PA, PO, PG, SY, SW, VED (24-38).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HOME ECONOMICS, 4-8

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); SC 202 or 211 or 273 or 235 or 204 Speech (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Elective from AT, MU or CA 116 (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 103 or 206 World History or Technology & Civilization (3); Approved Social Science Electives* from GY, HY, PO, SY (12).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science elective from BI, BY, ZY (10); Physical Science elective from CH (5); Mathematics elective from MH (5).

Electives from Above: 10 Hrs. Physical Science elective from CH, PS, PHS (5); Social Science or Humanities elective from above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. VED 346 Vocational and Adult Education or VED 541 Development of Vocational Education (3-5); CA 116L Art for Living Lab. (2); NF 112 Nutrition and Man (3); CA 105 Fundamentals of Clothing (5); Free Electives (2-3).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); VED 411 Teaching and Techniques (5); VED 410 Program Planning for Middle School (4); VED 550 Career Education (5).

Reading: 10 Hrs. CTR 370 Fundamentals of Reading I (5); CTR 571 Reading in Content Area (5).

Area of Specialization: 78 Hrs. CA 105 Fundamentals of Clothing (5); CA 113 Housing for Man (3); CA 115 Clothing and Man (3); CA 116L Art for Living Lab. (2); CA 206 Garment Structures (3); CA 233 Home Equipment (5); CA 323 Man the Consumer (3); CA 443 Home Management Residence (5); CA 116 Art for Every Day Living (3); CA 303 The House (5); FCD 270 Family II (4); FCD 330 Life Span Human Development (5); FCD 467 Parent Education (4); NF 104 Principles of Food Preparation (5); NF 112 Nutrition and Man (3); NF 204 Meal Management (5); FCD 301 Human Development III (5); Home Economics Elective (2).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HOME ECONOMICS, 7-12

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved SC Elective* (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Electives from AT, MU, CA 116 (2). (JM 315 approved as humanities elective.)

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 103 or 206 World or Technology & Civilization (3); Social Science Electives from ANT, EC, GY, HY, PG, PO, SY (12).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science from BI, BY, ZY (10); CH Elective (5); MH Elective (5).

Electives from Above: 10 Hrs. Physical Science from PHS, PS, CH (5); Social Science or Humanities Elective from above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. VED 346 or 41 Development/History of Vocational Education (3-5); CA 105 Fundamentals of Clothing (5); NF 112 Nutrition and Man (3); Free Electives (3-4).

Curriculum and Teaching and Media: 10 Hrs. EM 200 Educational Media (2); VED 412 Program in Area of Specialization (4); VED 411 Teaching in Area of Specialization (5).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 78 Hrs. CA 105 Fundamentals of Clothing (5); CA 113 Housing for Man (3); CA 115 Clothing and Man (3); CA 206 Garment Structures (3); CA 233 Home Equipment (5); CA 323 Man the Consumer (3); CA 431 Man-Environment Relations (2); CA 443 Home Management Residence (5); CA 116 Art for Everyday Living (3); CA 303 The House (5); FCD 270 Family II (4); FCD 330 Lifespan Human Development (5); FCD 467 Parent Education (4); NF 104 Principles of Food Preparation (5); NF 112 Nutrition and Man (3); NF 204 Meal Management (5); NF 304 Quantity Food Preparation (5); FCD 301 Human Development III (5); VED 462 Directed Work Experience (4-15).

*See Departmental Adviser for Approval of Electives prior to enrolling.

MARKETING AND DISTRIBUTIVE EDUCATION, 7-12

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved SC Elective* (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Electives from AT, MU, CA 116 (2). (JM 315 approved as humanities elective.)

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 103 or 206 World History or Technology & Civilization (3); Social Science Electives from ANT, EC, GY, HY, PG, PO, SY (12).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY (5); Physical Science Elective from PHS, PS, CY, GGL (10); MH Elective (5).

Electives from Above: 10 Hrs. EC 202 Economics (5); Electives from Humanities or Science or Mathematics (5).

Health and Physical Ed.: 4 Hrs. PE Elective (1-2); HPR 195 Health Science (2-3).

Electives: 16 Hrs. VED 346 or 541 Development/History of Vocational Education (3-5); Free Electives (12-13).

Curriculum and Teaching and Media: 10 Hrs. EM 200 Educational Media (2); VED 414 Program in Area of Specialization (3); VED 415 Teaching in Area of Specialization (5).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 70 Hrs. EC 200, 202 Economics (10); MN 310 Introduction to Management (3); ACF 340 Personal Finance (3); MT 331 Principles of Marketing (5); MT 241 Business Law I or MT 242 Business Law II or MT 344 Environmental Law or MT 255 Legal & Social Environmental Business or MN 346 Organization Behavior (4); MT 337 Fundamentals of Salesmanship or MN 440 Organization Theory or MN 442 Personnel Management or CA 325 Fashion Merchandising (4-5); MT 332 Marketing Communication Management or MT 341 Consumer Behavior or MT 432 Promotional Strategy or MT 437 Sales Management (5); MT 333 Merchandising Management or MT 433 Retail Store Management or MT 440 International Marketing (5); MT 438 Marketing Channel Systems or MT 372 Economics of Transportation or MT 473 Physical Distribution Management (5); EC 350 Labor Economics, or MN 380 Operations Mgt., or MN 315 Small Business Mgt., or MN 415 Applied Small Business Anal., or MN 420 Applied Business Management, or MN 386 Materials Mgt. (5); VED 510 Occupational Information (5); VED 556 Learning Resources (4); VED 558 Coordination in Vocational Programs (5); Approved Electives* (8).

*See Departmental Adviser for Approval of Electives prior to enrolling.

TRADE AND INDUSTRIAL, 7-12

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved SC Elective* (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Electives from AT, MU, CA 116 (2); JM 315 approved as humanities elective.)

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 103 or 206 World or Technology & Civilization (3); Approved Social Science Electives* from ANT, EC, GY, HY, PO, PG, or SY (12).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Electives from BI, BY, ZY (10); Physical Science Elective from CH, PHS, PS (5); MH Elective (5).

Electives from Above: 10 Hrs. Physical Science Elective from above (5); Humanities or Social Science Electives from above (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. VED 346 or 541 Development/History of Vocational Education (3-5); VED 466 Teaching Out of School Groups (3); Free Electives (9-10).

Curriculum and Teaching and Media: 10 Hrs. EM 200 Educational Media (2); VED 414 Program in Area of Specialization (3); VED 415 Teaching in Area of Specialization (5).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 55 Hrs. MN 310 Principles of Management (3); MN 500 Industrial Relations (5); VED 405 The School Shop (3); VED 510 Occupational Information or VED 550 Career Education (3-4); VED 558 Coordination (5); VED 475-480 Trade & Technical Experience (5-30); VED 462 Directed Work Experience (1-15); VED 574 Org. of Instruction (5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HEALTH EDUCATION, N-6

Common Requirements (40). See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Elective from MU, AT, TH and/or Dance (2).

Social Sciences: 20 Hrs. EC 200 Economics or EC 340 Environmental Economics (5); SY 201 Introduction to Sociology (5); SY 220 Statistics (5); HY select from HY 103 or 206 or 201 or 202 World History, Technology and Civilization or U.S. History (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); ZY 250 Anatomy (5); Physical Science Elective (CH, PS, PHS, AM, AY, GL) (5); MH (5).

Electives from Above: 10 Hrs. ZY 251 Physiology (5); Approved Social Science Elective* from EC, PA, PG, PO, RSY, HY, GY (5).

Health and Physical Ed.: 4 Hrs. PE 101 Physical Fitness: Self-Appraisal (2); HED 195 Health Science (2).

Electives: 16 Hrs. Electives (16).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); HED 394 Elementary Health Instruction (3); HED 414 Teaching Health Education (3); HED 423 Program in Health Education (3); HPR 519 Current Problems in Health Education or HED 594 Sex Education for Teachers or HED 691 Perspectives on Health Education or HED 597 Drug Abuse Education (5).

Reading: 5 Hrs. CTR 570 Reading in Content Area (5).

Area of Specialization: 60 Hrs. BY 201 Microbes & Man (5); HED 195 Health Science (2); HED 295 School Health (3); HED 296 Community Health (3); HED 396 Drug Use and Abuse (3); HED 494 Emergency Care (3); NF 112 Nutrition and Man (3); ZY 250 Anatomy (5); ZY 251 Physiology (5); Approved Electives* as follows to include 14 hours 300 level or above: Family Health (3-5); Health Administration (5); Consumer Health (3-5) Health Education (12-16).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HEALTH EDUCATION, N-12**Common Requirements (40). See page 115.**

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Elective from MU, AT, TH and/or Dance (2).

Social Sciences: 20 Hrs. EC 200 Economics or EC Environmental Economics (5); SY 201 Introduction to Sociology (5); SY 220 Statistics (5); HY select from HY 103 or 206 or 201 or 202 World History, Technology and civilization or U.S. History (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); ZY 250 Anatomy (5); Physical Science Elective (CH, PS, PHS, AM, AY, GL) (5); MH (5).

Electives from Above: 10 Hrs. ZY 251 Physiology (5); Approved Social Science Elective* from EC, PA, PG, PO, RSY, HY, GY (5).

Health and Physical Ed.: 4 Hrs. PE 101 Physical Fitness: Self-appraisal (2); HED 195 Health Science (2).

Electives: 16 Hrs. SC 202 Speech Communication (3); Electives (13).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); HED 394 Elementary Health Instruction or HED 395 Secondary Health Instruction (3); HED 414 Teaching in Health Education (3); HED 423 Program in Health Education (3); HED 519 Current Problems in Health Education or HED 594 Sex Education for Teachers or HED 691 Perspectives on Health Education or HED 597 Drug Abuse (5).

Reading: 5 Hrs. CTR 570 Reading in Content Area or CTR 571 Reading in Content Area.

Area of Specialization: 60 Hrs. BY 201 Microbes & Man (5); HED 195 Health Science (2); HED 295 School Health (3); HED 296 Community Health (3); HED 396 Drug Use and Abuse (3); HED 494 Emergency Care (3); NF 112 Nutrition and Man (3); ZY 250 Anatomy (5); ZY 251 Physiology (5); Approved * Electives as follows to include 14 hours 300 level or above: Family Health (3-5); Health Administration (5); Consumer Health (3-5); Health Education (12-16).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HEALTH EDUCATION, 4-8**Common Requirements (40). See page 115.**

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Elective from MU, AT, TH and/or Dance (2).

Social Sciences: 20 Hrs. EC 200 Economics or EC 340 Environmental Economics (5); SY 201 Introduction to Sociology (5); SY 220 Statistics (5); HY select from HY 103 or 206 or 201 or 202 World History, Technology and Civilization or U.S. History (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); ZY 250 Anatomy (5); Physical Science Elective (CH, PS, PHS, AM, AY, GL) (5); MH (5).

Electives from Above: 10 Hrs. ZY 251 Physiology (5); Approved Social Science Elective* from EC, PA, PG, PO, RSY, HY, GY (5).

Health and Physical Ed.: 4 Hrs. PE 101 Physical Fitness: Self-appraisal (2); HED 195 Health Science (2-3); PE Elective (0-1).

Electives: 16 Hrs. Electives (16).

Curriculum and Teaching and Media: 22 Hrs. EM 200 Educational Media (2); HED 394 Elementary Health Instruction or HED 395 Secondary Health Instruction (3); HED 414 Teaching Health Education (3); HED 423 Program in Health Education (3); Teaching and Program in 2nd major (6); CTD 419 The Middle School (5).

Reading: 10 Hrs. CTR 570 Reading in Content Area (5); CTR 571 Reading in Content Area (5).

Area of Specialization: 40 Hrs. BY 201 Microbes and Man (5); HED 195 Health Science (2); HED 295 School Health (3); HED 296 Community Health (3); HED 396 Drug Use and Abuse (3); HED 494 Emergency Care (3); NF 112 Nutrition and Man (3); ZY 250 Anatomy (5); ZY 251 Physiology (5); Approved 300 Level or Higher Health Electives* (7).

*See Departmental Adviser for Approval of Electives prior to enrolling.

HEALTH EDUCATION, 7-12**Common Requirements (40). See page 115.**

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Elective from MU, AT, TH and/or Dance (2).

Social Sciences: 20 Hrs. EC 200 Economics or EC 340 Environmental Economics (5); SY 201 Introduction to Sociology (5); SY 220 Statistics (5); HY select from HY 103 or 206 or 201 or 202 World History, Technology and Civilization or U.S. History (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); ZY 250 Anatomy (5); Physical Science Elective (CH, PS, PHS, AM, AY, GL) (5); MH 140 (5).

Electives from Above: 10 Hrs. ZY 251 Physiology (5); Approved Social Science Elective* from above (5).

Health and Physical Ed.: 4 Hrs. PE 101 Physical Fitness: Self-appraisal (2); HED 195 Health Science (2).

Electives: 16 Hrs. Electives (16).

Curriculum and Teaching and Media: 17 Hrs. EM 200 Educational Media (2); HED 395 Secondary Health Instruction (3); HED 414 Teaching Health Education (3); HED 423 Program in Health Education (3); Teaching & Program in 2nd Major (6).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 40 Hrs. BY 201 Microbes and Man (5); HED 195 Health Science (2); HED 295 School Health (3); HED 296 Community Health (3); HED 396 Drug Use and Abuse (3); HED 494 Emergency Care (3); NF 112 Nutrition and Man (3); ZY 250 Anatomy (5); ZY 251 Physiology (5); Approved Electives* 300 level or higher (7).

*See Departmental Adviser for Approval of Electives prior to enrolling.

PHYSICAL EDUCATION, N-6**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, AR 360, PED 370, 373; CA 116, 116L, 345 and/or 375; TH (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); SY 201 Introduction to Sociology (5); HY Elective from HY 103 or 206 or 201 or 202 World; Technology & Civilization or U.S. History (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); Physical Science Elective (PS, PHS, CH, AM, AY, GL) (5); ZY 250 Anatomy (5); MH 140 or Higher (5).

Electives from Above: 10 Hrs. Approved Electives* from above (10).

Health and Physical Ed.: 4 Hrs. PE 101 Physical Fitness: Self-appraisal (2); HED 195 Health Science (2-3).

Electives: 16 Hrs. ZY 251 Physiology (5); PE Electives (2); Electives (9).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); PED 414 Teaching Physical Education (3); PED 423 Program in Physical Education (5); CTM 304 Music and Related Arts (5).

Reading: 5 Hrs. CTR 570 Reading in Content Area (5).

Area of Specialization: 61 Hrs. PED 118, 119 Skills & Concepts Individual & Dual Activities (6); PED 120 Skills & Concepts Gymnastics (4); PED 121 Skills & Concepts Aquatics (2); PED 122 Skills & Concepts Team Sports (3); PED 123 Skills & Concepts Dance (3); HED 195 Health Science (2-3); PED 201 History & Principles of Physical Education (3); PED 211 Sensorimotor Activities (3); PED 212 Elementary School Activities (3); PED 213 Dance for Children (3); PED 315 Kinesiology (4); PED 405 Physiology of Exercise (4); HPR 416 Adaptive Physical Education (3); PED 426 Measurement & Evaluation in Physical Education (3); PED 429 Motor Learning & Performance (3); PED 494 Emergency Care & First Aid (3); FCD 267 Child Development I (3); NF 112 Nutrition & Man (3); TH 306 or 305 Children's Theatre or Creative Dramatics (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

PHYSICAL EDUCATION, N-12**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, AR 360, PED 370, 373; CA 116, 116L, 345 and/or 375; TH (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); HY 103 or 206 or 201 or 202 (3-5); Approved Social Science Electives* from SY, EC, HY, GY, PG, ANT, PO (5-7).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); Physical Science Elective (PS, PHS, CH, AM, AY, GL) (5); ZY 250 Anatomy (5); MH (5).

Electives from Above: 10 Hrs. Approved Electives* from Humanities or Social Sciences above (10).

Health and Physical Ed.: 4 Hrs. PE 101 Physical Fitness: Self-appraisal (2); HED 195 Health Science (2).

Electives: 16 Hrs. ZY 251 Physiology (5); SC 202 Speech Communication (3); PE Electives (2); Electives (9).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); PED 414 Teaching in Physical Education (3); PED 423 Program in Physical Education (5); PED 207 Conduct of Dance or PED 208 Theory & Conduct of Team Sports or PED 209 Theory & Conduct of Individual & Dual Sports or PED 210 Theory & Conduct of Gymnastics or PED 351 Water Safety (6).

Reading: 5 Hrs. CTR 570 or CTR 571 Reading in Content Area (5).

Area of Specialization: 70 Hrs. PED 118, 119 Skills & Concepts Individual & Dual Activities (6); PED 120 Skills & Concepts Gymnastics (4); HPR 121 Skills & Concepts Aquatics (2); PED 122 Skills & Concepts Team Sports (3); PED 123 Skills & Concepts Dance (4); PED 201 History & Principles of Physical Education (3); PED 212 Elementary School Activities (3); HPR 315 Kinesiology (4); HPR 405 Physiology of Exercise (4); HPR 416 Adaptive Physical Education (3); PED 426 Evaluation of Measurement in Physical Education (3); PED 429 Motor Learning & Performance (4); PED 494 Emergency Care & First Aid (3); PED 202 or 203 or 204 or 206 Basketball, Baseball, Track & Field, Football (3); Approved Electives in PE* (2) and PED (9).

*See Departmental Adviser for Approval of Electives prior to enrolling.

PHYSICAL EDUCATION, 4-8**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, AR 360, PED 370, 373; CA 116, 116L, 345 and/or 375 (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); HY 103 or 206 or 201 or 202 (3-5); Approved Social Science Electives* from SY, EC, HY, GY, PG, ANT, PO (5-7).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); Physical Science Elective (PS, PHS, CH, AM, AY, GL) (5); ZY 250 Anatomy (5); MH (5).

Electives from Above: 10 Hrs. Approved Electives* from Humanities or Social Sciences above (10).

Health and Physical Ed.: 4 Hrs. PE 101 Physical Fitness: Self-appraisal (2); HED 195 Health Science (2-3).

Electives: 16 Hrs. ZY 251 Physiology (5); PE Electives (2); Electives (9).

Curriculum and Teaching and Media: 16 Hrs. EM 200 Educational Media (2); PED 414 Teaching Physical Education (3); PED 423 Program in Physical Education (5); Teaching and Program in 2nd major (6).

Reading: 10 Hrs. CTR 570 Reading in Content Area (5); CTR 571 Reading in Content Area (5).

Area of Specialization: 43 Hrs. PED 118, 119 Skills and Concepts Individual & Dual Activities I, II (6); PED 120 Skills and Concepts Gymnastics (4); PED 121 Skills and Concepts Aquatics (2); PED 122 Skills and Concepts Team Sports (3); PED 123 Skills and Concepts Dance (4); PED 201 History & Principles of Physical Education (3); PED 315 Kinesiology (4); PED 405 Physiology of Exercise (4); PED 416 Adaptive Physical Education (3); PED 426 Measurements & Evaluation in Physical Education (3); PED 429 Motor Learning & Performance (4); PED 494 Emergency Care & First Aid (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

PHYSICAL EDUCATION, 7-12**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261, 262 World Literature (9); Fine Arts Electives from AT, MU, AR 360, PED 370, 373, CA 116, 116L, 345, and/or 375; TH (2).

Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); HY 103 or 206 or 201 or 202 (3-5); Approved Social Science Electives* from SY, EC, HY, GY, PG, ANT, PO (5-7).

Natural and Physical Science and Mathematics: 20 Hrs. BI 101 Principles of Biology (5); ZY 250 Anatomy (5); Physical Science Elective (CH, PS, PHS, AM, AY, GL) (5); MH 140 College Algebra or Higher MH (5).

Electives from Above: 10 Hrs. Elective from Above (10).

Health and Physical Ed.: 4 Hrs. PE 101 Physical Fitness: Self-appraisal (2); HED 195 Health Science (2-3).

Electives: 16 Hrs. ZY 251 Physiology (5); PE Electives (2); Electives (9).

Curriculum and Teaching and Media: 10 Hrs. EM 200 Educational Media (2); PED 414 Teaching Physical Education (3); PED 423 Program in Physical Education (5).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 43 Hrs. HPR 118, 119 Skills and Concepts Individual Activities I, II (6); HPR 120 Skills and Concepts Gymnastics (4); HPR 121 Skills and Concepts Aquatics (2); HPR 122 Skills and Concepts Team Sports (3); HPR 123 Skills and Concepts Dance (4); HPR 201 History and Principles Physical Education (3); HPR 315 Kinesiology (4); HPR 405 Physiology of Exercise (4); HPR 416 Adaptive Physical Education (3); HPR 426 Measurement and Evaluation in Physical Education (3); HPR 429 Motor Learning and Performance (4); HPR 494 Emergency Care & First Aid (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

INDUSTRIAL ARTS, N-12**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); Approved SC Elective* (3); EH 260 and/or 261 and/or 262 World Literature (6); Fine Arts Electives from AT, MU, CA 116 (2); JM 315 approved as humanities elective).

Social Sciences: 20 Hrs. EC 200 Economics (5); HY 103 or 206 World History or Technology & Civilization (3); Social Science Electives from ANT, EC, GY, HY, PG, PO, SY (12).

Natural and Physical Science and Mathematics: 20 Hrs. Natural Science Elective from BI, BY, ZY (5); Physical Science Electives from PHS, CH, PS (10); MH Elective (5).

Electives from Above: 10 Hrs. Social Science Elective from above (5); Physical Science Elective from PHS, CH, PS (5).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. VED 436 or 541 Development/History of Vocational Education (3-5); VED 200, Typewriting I (3); VED 246 Instructional Drawing (3); MN 310 Principles of Management (4); VED 405 School Shop (3).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); VED 414 Program in Area of Specialization (3); VED 415 Teaching in Area of Specialization (5); VED 556 Learning Resources (5).

Reading: 5 Hrs. CTR 571 Reading in Content Area (5).

Area of Specialization: 63 Hrs. IE 102 Graphical Comm. & Design I (2); IE 105 Engineering Drawing II, or IE 107 Graphic Solutions (2); VED 246 Instructional Drawing (3); VED 200 Typing (3); VED 403 Principles of Electricity (1); VED 407 Practicum in Electricity (4); VED 409 Teaching Electronics in Industrial Arts (4); VED 457 Practicum in Graphic Arts (3); VED 406 Practicum in Building Construction and Maintenance (5); VED 404 Practicum in General Metals (5); IE 111 Woodworking (1); IE 112 Welding Science and Application (1); IE 113 Machine Tool Laboratory (1); IE 114 Sheet Metal Design and Fabrication; IE 115 Foundry Technology (1); VED 400 Introduction to Power Mechanics (5); VED 401 Practicum in Small Gasoline Engines (5); VED 402 Automotive Construction and Repair (5); CA 345 Creative Crafts (3); VED 405 The School Shop (3); MN 310 Principles of Management (4).

*See Departmental Adviser for Approval of Electives prior to enrolling.

MUSIC, INSTRUMENTAL N-12**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261 World Literature (6); MU 131 Materials & Organization of Music (5).

Social Sciences: 21-22 Hrs. EC 200 Economics (5); Approved Social Science* from HY US/AM/World History or PO (5-6); SY 201 Introduction to Sociology (5); MU 351, 352 Music History (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 105 Perspectives in Biology (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective MH (5); Elective from Science or Math (5).

Electives from Above: 11 Hrs. MU 132 Materials and Organization of Music (5); EH 262 World Literature (3); MU 353 Music History (3).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 18 Hrs. MU 133, 231, 232 Materials & Organization of Music (15); Approved Elective (3).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); MU 409T Marching Band Techniques or MU 410T Orchestral Techniques (3); CTM 394 Teaching Elementary Instrumental Music (3); CTM 593 Material & Organization of School Orchestras or CTM 594 Material & Organization of School Bands (3); MU(T) or CTM or MU Electives (4).

Reading: 5 Hrs. CTR 570 or CTR 571 Reading in Content Area (5).

Area of Specialization: 64 Hrs. Applied Music MUA 187, 188, 189 (3); MUA 287, 288, 289 (3); MUA 387, 388, 389 (3); MUA 487, 488, (3); MUA 184, 185, 186 (3); MUA 284, 285, 286 (3); MU 233 Material & Organization of Music (5); MU 351, 352, 353 Music History (9); MU 361, 362, 363 Conducting (6); MU Ensembles (11); MU 110T-120T Instruments Class (8); MU 454 Instrumental Literature (3); MU 477 or 537 Music Arranging or Orchestration (3); MU, MU(T) or CTM Electives (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

MUSIC, VOCAL/CHORAL, N-12**Common Requirements (40). See page 115.**

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261 World Literature (6); MU 131 Materials & Organization of Music (5).

Social Sciences: 21-22 Hrs. EC 200 Economics (5); Approved Social Science* from HY US/AM/World History or PO (5-6); SY 201 Introduction to Sociology (5); MU 351, 352 Music History (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 105 Perspectives in Biology (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective MH (5); Elective from Science or Math (5).

Electives from Above: 11 Hrs. MU 132 Materials and Organization of Music (5); EH 262 World Literature (3); MU 353 Music History (3).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 18 Hrs. MU 133, 231, 232 Materials & Organization of Music (15); Approved Elective (3).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); MU 411T Choral Techniques (3); CTM 304 Music and Related Arts (3); CTM 595 Material & Organization of School Choirs (3); MU(T) or CTM Electives (4).

Reading: 5 Hrs. CTR 570 or CTR 571 Reading in Content Areas (5).

Area of Specialization: 64 Hrs. Applied Music MUA 187, 188, 189 (3); MUA 287, 288, 289 (3); MUA 387, 388, 389 (3); MUA 487, 488 (2); MUA 184, 185, 186 (3); MUA 284, 285, 286 (3); MU 233 Material & Organization of Music (5); MU 351, 352, 353 Music History (9); MU 361, 362, 363 Conducting (6); MU Ensembles (11); MU 442T Vocal Pedagogy (3); MU 478 Music Arranging (3); MU 553 Choral Literature (3); MU, MU(T) or CTM Electives (8).

*See Departmental Adviser for Approval of Electives prior to enrolling.

MUSIC, GENERAL N-9**Common Requirements (40). See page 115.**

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260, 261 World Literature (6); MU 131 Materials & Organization of Music (5).

Social Sciences: 21-22 Hrs. EC 200 Economics (5); Approved Social Science* from HY US/AM/World History or PO (5-6); SY 201 Introduction to Sociology (5); MU 351, 352 Music History (6).

Natural and Physical Science and Mathematics: 20 Hrs. BI 105 Perspectives in Biology (5); Physical Science Elective from PHS, PS, CH, GL, AM, AY (5); Mathematics Elective MH (5); Elective from Science or Math (5).

Electives from Above: 11 Hrs. MU 132 Materials and Organization of Music (5); EH 262 World Literature (3); MU 353 Music History (3).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 18 Hrs. MU 133, 231, 232 Materials & Organization of Music (15); Approved Elective (3).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); CTM 304 Music and Related Arts (3); CTM 396 Early Childhood, Elementary Music Program (3); MU(T) or CTM or MU Electives in Curriculum or Teaching (7).

Reading: 5 Hrs. CTR 570 or CTR 571 Reading in Content Area (5).

Area of Specialization: 64 Hrs. Applied Music MUA 187, 188, 189 (3); MUA 287, 288, 289 (3); MUA 387, 388, 389 (3); MUA 487, 488 (2); MUA 184, 185, 186 (3); MUA 284, 285, 286 (3); MU 233 Material & Organization of Music (5); MU 351, 352, 353 Music History (9); MU 361, 362, 363 Conducting (6); MU Ensembles (11); MU 411T Choral Techniques (3); MU 477 or 478 or 537 Music Arranging or Orchestration (3); CTM 597 Organization of General Music Programs (4); Select (4) from: MU 101-103T, 110-119T Instrument Classes; MU, MU(T), CTM Approved Electives* (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

EARLY CHILDHOOD FOR HANDICAPPED, N-3**Common Requirements (40). See page 115.**

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260 or 261 or 262 World Literature (3); Approved Literature Electives* (5); AT 171 or 172 or 173 History of World Art (3).

Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); SY 201 Introduction to Sociology (5); Approved Social Science Elective* (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 105 Perspectives in Biology (5); Natural Science Selected from BI 106 or 107 or 108 or ZY 105 or 250 (5); Approved Physical Elective* (5); Mathematics selected from MH 100 or 140 or 151 or 160 or 161 or 281 (5).

Electives from Above: 10 Hrs. EH 304 or 315 Technical Writing or Business & Professional Writing (3); HY 103 or 206 World History or Technology & Civilization (3); Approved Elective Social Science*, Science or Mathematics (4).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. RSE 104 Introduction to Laboratory Experiences (1); RSE 495 Practicum (5); RSE 479 Methods (5); RSE 377 Introduction to Mental Retardation or RSE 378 Introduction to Behavior Disturbance or RSE 529 Introduction to Learning Disabilities (5).

Curriculum and Teaching and Media: 21 Hrs. EM 200 Education Media (2); RSE 300A Curriculum, N-4 (5); RSE 588 Ed. Approaches with Handicapped Infants & Toddlers (4); RSE 420 Organizing Instruction (5); RSE 550 Language Development of the Handicapped (5).

Reading: 10 Hrs. CTR 370, 371 Fundamentals of Reading I, II (10).

Area of Specialization: 40 Hrs. SC 202 Speech Communication (3); HPR 211 Sensorimotor Activities (3); AT 301 Art for Teachers (5); MU 371 Music for Teacher (3); FCD 267 Human Development I (4); FCD 300 Approach to Child Study (5); FCD 301 Human Development II (4); CTM 304 Music and Related Arts (5); EM 510 Media for Children (4); RSE 587 Education for Parents of Handicapped Children (4).

*See Departmental Adviser for Approval of Electives prior to enrolling.

EMOTIONALLY CONFLICTED, N-12**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260 or 261 or 262 World Literature (3); Approved Literature Elective* (5); AT 171 or 172 or 173 History of World Art (3).
Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); SY 201 Introduction to Sociology (5); PG 315 Quantitative Methods or Approved Social Science Elective* from PG, SY, PA, EC, ANT, GY, SW, HY, PO (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 105 Perspectives in Biology (5); Natural Science Elective from BI 106 or 107 or 108 or ZY 105 or ZY 250 (5); PHS 100 Physical Science or Approved Physical Science* from PS, GL, CH, AM 304, or AY 310 (5); MH 100 or 140 or 151 or 160 or 281 Mathematics (5).

Electives from Above: 10 Hrs. EH 304 or 315 Technical Writing or Business & Professional Writing (3); HY 103 or 206 World History or Technology & Civilization (3); Approved * Elective from Social Science, Mathematics or Science above (4).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Approved * Electives (16).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); CTR 370 Fundamentals of Reading Instruction I (5); RSE 300 Curriculum & Teaching N-4 (4); RSE 301 Curriculum & Teaching 5-12 (4).

Reading: 5 Hrs. CTR 570 or CTR 571 Reading in Content Area (5).

Area of Specialization: 60 Hrs. RSE 104 Orientation to Special Education (1); RSE 420 Organizing Instruction in Special Education (5); RSE 421 Educational Diagnosis & Assessment in Special Education (5); RSE 450 Special Topics (5); RSE 446 Directed Independent Study (4-6); RSE 586 Teaching the Severely Profoundly Handicapped (3); VED 550 Career Education (4); Choose two from RSE 377 Introduction to Mental Retardation; CD 350/450 Introduction to Speech Pathology/Audiology; RSE 529 Learning Disabilities; RSE 550 Language Development for Young Handicapped Child; CD 552 Language Disorders; RSE 587 Parent Education for Exceptional Children (9-10); RSE 378 Introduction to Behavior Disturbance (5); RSE 479 Methods & Materials for Teaching in Special Education (5); RSE 495 Practicum (5-7); PG 350 Behavior Modification in Early Childhood (5); PG 435 or 536 Abnormal Psychology or Psychology of Abnormal Children and Adolescents (4-5).

*See Departmental Adviser for Approval of Electives prior to enrolling.

MENTALLY RETARDED, N-12**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260 or 261 or 262 World Literature (3); Approved Literature Elective* (5); AT 171 or 172 or 173 History of World Art (3).
Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); SY 201 Introduction to Sociology (5); PG 315 Quantitative Methods or Approved Social Science Elective* from PG, SY, PA, EC, ANT, GY, SW, HY, PO (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 105 Perspectives in Biology (5); Natural Science Elective from BI 106 or 107 or 108 or ZY 105 or ZY 250 (5); PHS 100 Physical Science or Approved Physical Science* from PS, GL, CH, AM 304 or AY 310 (5); MH 100 or 140 or 151 or 160 or 161 or 281 Mathematics (5).

Electives from Above: 10 Hrs. EH 304 or 315 Technical Writing or Business & Professional Writing (3); HY 103 or 206 World History or Technology & Civilization (3); Approved Elective* from Social Science, Mathematics or Science Above (4).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Approved Electives* (16).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); CTR 370 Fundamentals of Reading Instruction I (5); RSE 300 Curriculum & Teaching N-4 (4); RSE 301 Curriculum & Teaching 5-12 (4).

Reading: 5 Hrs. CTR 570 or CTR 571 Reading in Content Area (5).

Area of Specialization: 60 Hrs. RSE 104 Orientation to Special Education (1); RSE 420 Organizing Instruction in Special Education (5); RSE 421 Educational Diagnosis & Assessment in Special Education (5); RSE 450 Special Topics (5); RSE 446 Directed Independent Study (4-6); RSE 586 The Severely Handicapped (3); VED 550 Career Education (4); RSE 378 Introduction to Behavior Disturbance or CD 350/450 Introduction to Speech Pathology/Audiology (5); RSE 529 Learning Disabilities or RSE 550 Language Development for Young Handicapped Children or CD 552 Language Disorders or RSE 587 Parent Education for Exceptional Children (9-10); RSE 377 Introduction to Mental Retardation (5); RSE 479P Methods & Materials for Teaching MR (5); RSE 495P Practicum Mild Mental Retardation (2); RSE 495P Practicum — Moderate Mental Retardation (2); RSE 495P Practicum — Severely Handicapped (2); PED 517P Physical Education for the Mentally Retarded (3); RSE 585 The Moderately Mentally Retarded (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

SPEECH PATHOLOGY, N-12**Common Requirements (40).** See page 115.

Humanities and Fine Arts: 20 Hrs. EH 101, 102, 103 English Composition or EH 105, 106 Honors English (9); EH 260 or 261 or 262 World Literature (3); Approved Literature Elective* (5); AT 171 or 172 or 173 History of World Art (3).
Social Sciences: 20 Hrs. EC 200 Economics (5); PG 211 Psychology (5); SY 201 Introduction to Sociology (5); PG 315 Quantitative Methods or Approved Social Science Elective* from PG, SY, PA, EC, ANT, GY, SW, HY, PO (5).

Natural and Physical Science and Mathematics: 20 Hrs. BI 105 Perspectives in Biology (5); Natural Science Elective from BI 106 or 107 or 108 or ZY 105 or ZY 250 (5); PHS 100 Physical Science or Approved Physical Science* from PS, GL, CH, AM 304 or AY 310 (5); MH 100 or 140 or 151 or 160 or 161 or 281 Mathematics (5).

Electives from Above: 10 Hrs. EHA 304 or EHA 315 Technical Writing or Business & Professional Writing (3); HY 103 or 206 World History or Technology & Civilization (3); Approved Elective* from Social Science, Mathematics or Science above (4).

Health and Physical Ed.: 4 Hrs. PE Elective (2); HED 195 Health Science (2).

Electives: 16 Hrs. Approved Electives* (16).

Curriculum and Teaching and Media: 15 Hrs. EM 200 Educational Media (2); RSE 420 N Organization of Instruction in Speech Pathology (5); RSE 479 Methods & Materials in Speech Pathology (5); RSE 421 Ed. Diagnosis and Assessment in Special Ed. (5).

Reading: 5 Hrs. CTR 570 or CTR 571 Reading in Content Area (5).

Area of Specialization: 60 Hrs. RSE 104 Orientation to Speech Pathology (1); CD 340 Speech and Hearing Mechanism (5); CD 341 Phonetics (3); CD 350 Introduction to Speech Pathology & Audiology (5); CD 455 Introduction to Clinical Procedures in Speech Pathology (4); CD 456 Clinical Practicum in Speech Pathology (1, Repeatable); CD 551 Articulation Disorders (5); CD 552 Normal & Deviant Language Acquisition in Children (5); CD 553 Fluency Disorders (5); CD 554 Vocal Disorders (5); CD 560 Introduction to Audiology (5); CD 561 Hearing Pathology (5); CD 562 Hearing Evaluation/Rehabilitation/Conservation (5); CD 465 Introduction to Clinical Procedures in Audiology (3); RSE 446 N Independent Study in Speech Pathology (3).

*See Departmental Adviser for Approval of Electives prior to enrolling.

Field Experiences

The Laboratory Experiences Program provides sequential learning opportunities in public school and community settings for all students throughout the teacher preparation program. Laboratory experiences are provided primarily through the following programs: (1) **Field Experience Program**, (2) **Extended Laboratory Experiences** including a para-professional level program for secondary majors, (3) **Cooperative Education Program**, and (4) **the Professional Internship**.

The pre-teaching **Field Experience Program** provides an initial experience for all students as a prerequisite for admission to the Professional Teacher Education Program. Students are required to participate in the program in conjunction with Career Exploration and Planning (IED 101), or in Orientation for Transfer Students. This experience involves the students in planning and evaluating learning experiences, counselling, participating in pre-school conferences and faculty study, school and community meetings, and involvement in actual teaching situations.

The Extended Laboratory Experiences Program is conducted concurrently with enrollment in professional education courses which provide experiences in the schools and communities.

The Co-operative Education Program provides laboratory experiences for certain students involved in the teacher preparation program on an alternating quarter arrangement with college attendance. (For description see page 40).

The Professional Internship is a full-time assignment in an off-campus school and community. Experiences include personal and professional contacts with various phases of community life and the application of concepts, skills and knowledge the students have acquired in classroom situations.

The students enroll for 15 credit hours and devote a full quarter to the internship. No additional coursework, correspondence or regular, is permitted during the internship quarter. The program is divided into orientation, off-campus experience, and evaluation. Students must be admitted to the Teacher Education Program prior to the Professional Internship and must have completed appropriate courses in their areas of specialization.

The Internship for students in N-12 Programs requires experience in both elementary and secondary schools.

Other laboratory experiences for students are provided within the framework of courses in the Teacher Education Program.

Dual Objectives Program

Students in other schools of the University who wish to complete requirements for graduation in an academic department and also to complete the degree requirements of the Teacher Education Program may pursue the dual objectives program.

Students electing to pursue the dual objectives program will have an adviser in the academic department in which they are enrolled and an adviser in the School of Education. Advising students concerning the curriculum of the academic department, including the major and other requirements, will be the responsibility of the adviser in that department. The responsibility for advising students on matters concerning the Teacher Education Program will be that of the adviser in the School of Education. The quarterly course schedule of the students will be approved by both advisers. Information describing the dual objectives program is available in the Teacher Education Services Office of the School of Education in Haley Center and in the Office of the Dean of the School in which the students are enrolled.

Students enrolled in the School of Education who desire to complete certification requirements in more than one teaching field will complete the curriculum in each field: general studies, teaching specialization and professional teacher education (including the internship).

Applications and specific information about the criteria for selection and admission to Teacher Education are available in the Teacher Education Services Office in Haley Center 3464.

Program Options, Non-Teaching

The following programs offered through the School of Education are education-related options which prepare students for service careers which do not require teacher certification.

Adult Education

Humanities and Social Sciences: 31 Hrs. EH 101, 102, 103 English Composition (9); SC 202 Speech Communication (3); HY 101 or 204, 102 or 205, 103 or 206 World History or Technology and Civilization or EH 260, 261, 262 World Literature (9)*; EC 200 or AEC 202 Economics (5); EC 202 Economics (5) or SY 201 Sociology (5) or Humanities and Fine Arts Elective (5)*.

Natural and Physical Sciences and Mathematics: 15 Hrs. Mathematics Elective from MH (5); Natural and Physical Science Electives from BI, CH, GL, PHS, PS (10)*.

*Electives: 10-21 Hrs.

Adult Education Composite: 46 Hrs. VED 102 F Orientation to Adult Ed. (1); EM 200 Ed. Media (2); FED 300 Ed. Psychology or PG 211 Psychology (5); FED 400 Measurement & Evaluation or RSY 541 Extension Program & Methods (5); VED 415 F Teaching Adult Ed. (5); VED 466 Teaching Out-of-School Groups (3); VED 513 Nature of Adult Ed. (5); CED 521 Guidance & Counseling (4); VED 104 F Orientation Internship (1); VED 425 F Internship Adult Ed. (15).

Area of Specialization*: 85-100 Hrs. Technical Agriculture Education (100) or Community and Conference Education Courses (100) or Distributive Education Courses (100) or Home Economics Education Courses (100) or Trade and Technical Health Occupations Education Courses (100).

See departmental adviser for specific requirements.

Community Health Education. This non-teaching program does not require admission to Teacher Education. However, a community health internship (HED 425) is required.

General Studies (90 Quarter Hours)

Humanities (20 quarter hours)	
EH 101 English Composition	3
EH 102 English Composition	3
EH 103 English Composition	3
EH 260 Lit. Western World	3
EH 261 Lit. Western World	3
EH 262 Lit. Western World	3
Fine Arts Elective	2

Social Sciences (20 quarter hours)	
EC 200 Economics (or)	
EC 340 Environmental Economics	5
SY 201 Introduction to Sociology	5
SY 220 Statistics	5
HY 103, 201, 202 or 206	5

Natural and Physical Sciences (20 quarter hours)	
BI 101 Principles of Biology	5
Approved Physical Science	5
MH	5
ZY 250 Anatomy	5

Area Course (10 quarter hours)	
ZY 251 Physiology	5
Approved Social Science Elective	5

Health Education and Physical Education (4 quarter hours)	
HED 195 Health Science	2
PE 101 Physical Fitness: Self-appraisal	2

Electives (16 quarter hours)	
Approved Electives	16

Professional Studies (120 Quarter Hours)

Foundation Courses (17 quarter hours)	
BI 210 Microbes and Man	5
EM 200 Educational Media	2
FED 300 Educational Psychology	5
RSY 362 Community Organization	5

Professional Courses (61 quarter hours)	
HED 295 School Health	3
HED 296 Community Health	3
HED 394 Elem. Health Instruction (or)	
HED 395 Sec. Health Instruction	3
HED 396 Drug Use and Abuse	3
HED 423 Program in Health Education	3
HED 494 Emergency Care-First Aid	3
NF 112 Nutrition and Man	3
Approved course (s) in:	20
Environmental Health and Safety	
Health Administration and Community	
Nutrition and Foods	
Family Health and Sexuality	
General Health Electives	20

Approved Electives (27 quarter hours) 27

Internship (15 quarter hours)	
HED 425 Internship	15

TOTAL — 210 QUARTER HOURS

Human Movement Studies. This non-teaching option in the physical education program does not require admission to Teacher Education. However, the student must be screened prior to Internship (PED 425).

General Studies (90 Hours)

Humanities (20 Quarter Hours)	
EH 101, 102, 103 English Composition, or	
EH 105, 106, English	9
EH 260, 261, 262 World Literature	9
AT, TH, MU, AR 36, PED 370, 373,	
CA 116, 116L, 345, 375	2
Social Science (20 Quarter Hours)	
EC 200 — Economics	5
PG 211 Psychology	5
Social Science Elect (must include	
HY 201, 202, 103/206	10
Natural and Physical Science (20 Quarter Hours)	
MH 140 College Algebra or Above	5
BI 101 Principles of Biology	5
Approved Physical Science	5
ZY 250 Anatomy	5
Credits from 2 of the above	
3 areas, 10 Quarter Hours	
10 quarter hours from 2 of the above 3	
areas	
10	
Health Education and Physical Education	
(4 Quarter Hours)	
HED 195 Health Science	2
PE 101 Physical Fitness: Self-appraisal	2
Elective (16 Quarter Hours)	
ZY 251 Physiology	5
PE	2
Elective	9

Human Movement Studies (75 Quarter Hours)

Required Courses (46 Quarter Hours)	
PED 102 Orientation	1
PED 118 Skills & Con Ind Act I	3
PED 119 Skills & Con Inc Act II	3
PED 120 Skills & Con Gym	4
PED 121 Skills & Con Aquatics	2
PED 122 Skills & Con Team Sports	3
PED 123 Skills & Con Dance	4
PED 201 Hy & Principles of PE	3
PED 315 Kinesiology	4
PED 405 Phy. of Exercise	4
PED 423 Program in Physical Ed	5
PED 426 Measurement & Evaluation in PE	3
PED 429 Motor Learning & Per.	4
PED 494 — Emergency Care/First Aid	3
Approved Electives (29 hours) in Professional Physical Education (PED Courses)	
Internship	
PED 425	15
Approved Electives/Minor	
30	

TOTAL — 210 QUARTER HOURS

Office Administration. A non-teaching program designed to prepare students to become professional secretaries, administrative assistants or to assume other responsible positions in business, government, or professional offices. This program does not require Admission to Teacher Education.

Office Administration Program

FRESHMAN YEAR			Third Quarter		
First Quarter			Second Quarter		
MH	Science	5	EH 103 Eng. Comp.	3	
	Science	5	HY/AT/EH*	3	
HY/AT/EH*		3	VED 200 Typewriting I	3	
EH 101 Eng. Comp.	3		Elective	3	
VED 102KOrient	1		PG 211 Psychology	5	
SOPHOMORE YEAR					
EC 200 Economics	5		SY 201 Sociology	5	
VED 201 Typewriting II	3		VED 203 Typ. IV	3	
SC 211 Pub. Spkg.	5		MN 274 Statistics or		
ACF 211 Acctg. I	4		PG 315 Quant. Meth.	5	
Elective	2		Elective	5	
JUNIOR YEAR					
MN 207 Data Proc.	2		VED 420 Machines	3	
VED 305 Rec. Mgt.	3		VED 312 Shorthand III	5	
VED 310 Shorthand I	5		VED 315 Mach. Trans.	1	
MN 310 Prin/Mgt.	4		Elective	5	
Elective	4		MT 331 Marketing	5	

SENIOR YEAR

VED 419 Trans. ....5	VED 422 Sec. Proc. I .....5	VED 421 Internship .....10
EHA 415 Bus. Comm. ....3	ACF 340 Personal Fin. or	VED 423 Sec. Proc. II .....5
MN 442 Pers. Mgt. ....4	ACF 361 Prin. Fin. or	
VED 430 Word Proc. ....5	CA 323 Man the Consumer. .3-5	
	Electives .....6-8	

TOTAL — 210 QUARTER HOURS

*Students may take any combination of World History, HY 101-102-103; Technology and Civilization, HY 204-205-206; History of Art, AT 171-172-173; and Western World Literature, EH 260-261-262.

**MH 169 if MN 274 is taken for statistics.

Recreation Administration. This non-teaching program does not require admission to Teacher Education. However, the student must be screened prior to internship (RA 425).

Major

General Studies

EH 101, 102, 103 English Composition	9
SC 202 Speech Communication	3
EH 253/260, 254/261, 255/262 Literature	9
BI 105 Perspectives in Biology	5
BI 106 Human Biology/BI 107 Environmental Biology	5
Physical Science Electives (PHS, PS, CH, GL, AM, AY)	10
HY 101/204, 102/205, 103/206 World History/Technology and Civilization	9
SY 201 Introduction to Sociology	5
EC 200 Economics	5
PO 210 American State and Local Government	5
MH Mathematics Elective	5
PE Electives	6
Social Science Elective	5
RA 102 Orientation	1

Basic Core

RA 282 Principles of Recreation	3
RA 386 Recreation Leadership	3
RA 387 Outdoor Recreation	3
RA 388 Camp Management	3
RA 486 Park Planning	3
PE 494 Emergency Care and First Aid	3
ACF 211 Principles of Accounting I	4
RSY 362 Community Organization	5
MN 310 Principles of Management	4
MT 344 Environmental Law	4
MN 442 Personnel Management	4
JM 315 Technical Journalism	3
RA 384 Park and Recreation Maintenance	3
RA 423 C Recreation — Program & Administration	5
RA 425 C Internship	15

Select Option A or B

A. PED 118 Individual & Dual Activities I	3
PED 119 Individual & Dual Activities II	3
PED 120 Gymnastics	4
RA 351 Water Safety or PED 121 Aquatics	2/3
PED 122 Team Sports	3
PED 123 Dance	4
CA 345 Creative Crafts	2
TH 315/305/306 Dramatics/Theatre	3
PED 424 Intramurals & Officiating	3
RA 485 Social Recreation	3
B. RA 389 Recreation Interpretative Services	3
RA 487 Park Management	3
ZY 206 Conservation in the U.S.	3
FY 460 Wildland Recreation	3
HF 221 Landscape Gardening	5
Approved Electives	15

Electives	VAR
Total Required Hours	210

Minor

RA 282 Principles of Recreation	3
RA 386 Recreation Leadership	3
RA 387 Outdoor Recreation	3
RA 388 Camp Management	3
PED 494 Emergency Care and First Aid	3
Approved Electives	15

Rehabilitation Services Education. This non-teaching program does not require completion of the Professional Education Core.

GENERAL EDUCATION	63 Hours Total
English	
EH 101-102-103 English Composition (3-3-3)	9
EH Literature (American-English-World)	9
SC 202 Applied Speech Communication	3
Social Science	
HY 101-102-103 World History (3-3-3) or	9
HY 204-205-206 Tech. and Civilization (3-3-3)	
PG 211 Intr. to Psychology	5
Natural Sciences	
BI 101 Principles of Biology	5
Approved Physical Sciences	10
Mathematics	
MH 140-College Algebra or MH 160 -Pre-Calculus with Trigonometry	5
Physical Education	
PE Approved Physical Education (1-1-1)	3
Elective	5
HUMAN SERVICES FOUNDATIONS	99 Hour Total
Educational	
IED 101 — or RSE 102R Career Explor. & Planning	1
EM 200 — Educational Media	2
FED 300 — Educational Psychology	5
CED 322 — Human Relations in Education	2
FED 400R — Evaluation in Education	5
Psychological	
PG 433 — Personality	4
PG 435 — Behavior Pathology or FED 534	4(5)
Personality Dynamics and Effective Behavior	
Psychology Elective	5
Sociological	
SY 201 — Intr. Sociology	5
Sociology Elective or FED 350 (Sociological Option)	5
CED 524 — Community Resources Rehabilitation	3
Biological/Medical	
ZY 250 — Human Anatomy	5
ZY 251 — Physiology	5
CED 523 — Medical and Adjustment Aspects of Rehab.	4
Vocational	
EC 206 — Socio-Economic Foundation of Cont. America	3
RSE 535 — Intro. Vocational Evaluation	5
RSE 537 — Occ. Orientation of Develop. Disabled	5
RSE 538 — Work Adjustment in Rehabilitation	5
Exceptionality	
RSE 330 — Careers in Rehabilitation	5
RSE 376 — Exceptionality	5
RSE 414 — Assessment Methods in Rehabilitation	3
RSE 415 — Teaching and Behavior Change Strategies in Rehabilitation	3
RSE 495R — Practicum in Rehabilitation	5
CED 522 — Intro. Counseling the Exceptional	4
REHABILITATION SPECIALTY LEVEL	48 Hour Total
RSE 446R — Independent Study-Rehabilitation	3
RSE 495R — Practicum in Rehabilitation	5
RSE 425R — Internship in Rehabilitation	15
Approved Program in Area of Specialty	25
Total	210 Hours

Graduate Programs

Graduate programs are offered through the Graduate School in administration and supervision; counselor education; educational media; elementary education; health education; physical education; rehabilitation services; secondary education; special education; and vocational and adult education.

Fifth and sixth-year programs of study in the above areas lead to the degrees of Master of Science, Master of Education, and Specialist in Education. Nondegree graduate study is also available through the Diploma Program leading to sixth-year certification.

The Doctor of Education is offered in Educational Leadership, Counselor Education, Elementary Education, Health Education, Physical Education, Secondary Education, and Vocational and Adult Education. Specializations in Secondary Education include the following sub-specializations: (a) English Education, (b) Mathematics Education, (c) Science Education, and (d) Social Science Education. See *Graduate School Bulletin*.

The Master of Education, Master of Science in Education, Specialist in Education and Doctor of Education are offered for junior college administrators, student personnel administrators, and teachers. These programs meet requirements of the Southern Association of Colleges and Schools, the Graduate School, and the School of Education. Sufficient flexibility exists to permit students to adapt programs to their individual needs.

Related Programs and Services

Teacher Certification Services

Programs in the School of Education are approved by the National Council for Accreditation of Teacher Education (NCATE), the National Association of State Directors of Teacher Education and Certification (NASDTEC), the Interstate Reciprocity Compact (IRC) and the Alabama State Board of Education for certifying superintendents, supervisors, principals, counselors, elementary and secondary teachers, and educational media specialists. Upon satisfactory completion of a prescribed course of study and upon recommendation of the Dean of the School of Education a professional certificate will be issued by the appropriate State Department of Education. Twenty-eight State Departments of Education now have reciprocal agreements for issuing certificates to graduates of institutions accredited by NCATE.

Students in schools other than the School of Education who wish to complete requirements for graduation in an academic department and also to complete the degree requirements of the Teacher Education Program may pursue the dual objectives program. Students may also take courses in education and psychology for acquiring knowledge and understanding of human growth and development, and teaching as a profession. They are eligible to take all such courses for which they satisfy prerequisites.

In-Service Agricultural Education and Supervision

J. C. HOLLIS, *State Supervisor*

Assistant Supervisors Holley, Halcomb, Lewis, and White

In cooperation with the State Department of Education, the School of Education maintains an in-service teacher education and supervisory division. This service extends to 400 departments of vocational agriculture in accredited high schools of the State.

Vocational Rehabilitation Service

HOWARD, HUDSON, AND PATTERSON, *Counselors*

The State Department of Education in cooperation with Auburn University maintains the local Rehabilitation Service which provides vocational guidance, counseling, training, and placement services to handicapped citizens. The Rehabilitation Service also makes available to handicapped citizens such services as: surgical and/or medical care, hospitalization, therapeutic treatment, and artificial appliances, when these services are essential to training and/or employment and the individual is not financially able to secure them.

Learning Resources Center

The Learning Resources Center (LRC), located in Haley Center, is a service component for the School of Education and the School of Arts and Sciences. The LRC provides media services which include filmstrips, transparencies, disc recordings, tape recordings, kits, educational games, and programs of instruction. LRC personnel assist the faculty and students with the production, selection, and utilization of learning materials.





School of Engineering

LYNN E. WEAVER, *Dean*

EDWARD O. JONES, *Assistant Dean*

M. DAYNE ALDRIDGE, *Assistant Dean*

JOSEPH S. BOLAND III, *Assistant Dean*

ENGINEERS in the Eighties are faced with world-wide problems and expectations awesome in responsibility yet exciting as professional challenges. These range from the extremes of interplanetary exploration through earth orbiting systems to the problems arising mainly from our population explosion: energy, better productivity, housing, transportation, and pollution control.

As a renewed appreciation develops for the contribution of science and technology, engineering leaders are calling for engineers better equipped to tackle the specific, technical problems of the future. Significantly, they also are calling for engineers who by breadth of education and understanding of other disciplines can convince others of the role of engineers not only in technical matters but in policy decisions to insure the use of technology to benefit mankind. We hope, therefore, we are entering an era in which science and technology will receive a more objective assessment.

Engineering education at Auburn provides in a four-year curriculum both the technical knowledge and the broad general education necessary to equip engineers for their problem-solving challenges. Centered around mathematics and the physical sciences, the curricula also stress the importance of social sciences, humanities, and communication skills. Auburn's engineering programs enable individuals to develop their natural talents and to provide knowledge, skills, and understanding that will encourage them to find their places in society as well as in their vocations.

Admission

Freshmen eligibility is determined by the Admissions Office. However, since the requirements for engineering education necessitate high school preparatory work of high intellectual quality and of considerable breadth, the following program is recommended as *minimum* preparation: English, four units; mathematics (including algebra, geometry, trigonometry, and analytical geometry), four units; chemistry, one unit; history, literature, social science, two or three units. Physics and foreign languages are recommended but not required.

Transfers from Other Institutions must apply through the Admissions Office. (See University regulations, p. 16.) The exact placement of these students can be determined only upon review of their transcripts by the School of Engineering.

Students transferring from junior colleges are allowed credit for equivalent courses taken at the junior colleges, subject to a maximum equal to the number of hours printed in the first two years of their curriculum. The acceptable courses are not, however, limited to the listings within the first two years.

Many courses required by the School of Engineering are highly specialized in their content and potential transfer students need to select courses with care. Therefore, to insure maximum transferability of credits, students are encouraged to contact the School as soon as possible about acceptable credits.

Transfers from On-Campus must be approved by the School of Engineering and the admissions committee of the chosen curriculum.

Degree Requirements — To earn the bachelor's degree in the School of Engineering, students must complete all the subjects in their curricula and must have a minimum grade point average of 2.0 in all work attempted at Auburn University.

Effective Summer Quarter 1985, the School of Engineering Graduation Requirements will be a cumulative Grade Point Average of 2.0 on all courses attempted, and in addition, a 2.0 cumulative on all work passed in the major.

The major is defined as all course work with the departmental prefix in the students' curriculum . . . that is, for electrical engineering students, all courses with the EE prefix are considered in the major.

Programs

Undergraduate

Pre-Engineering — The Pre-Engineering Program consists of a freshman program of studies to prepare students for curricula in the School of Engineering. It also provides academic and career counseling to assist students in determining the curriculum that best fulfills their personal and educational objectives.

Professional Programs — Curricula accredited by the national accrediting agency, the Accreditation Board for Engineering and Technology (formerly the Engineers' Council for Professional Development), lead to the degrees of Bachelor of Aerospace Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, Materials Engineering, Mechanical Engineering, Bachelor of Science in Agricultural Engineering, and Bachelor of Textile Management and Technology.

These curricula are designed to meet the educational requirements of the engineering professions. The program in the fundamental sciences of mathematics, chemistry, and physics is followed by a study of basic engineering sciences. Specialized or departmental courses are taken in the third and fourth years with humanistic-social studies interspersed throughout the four years. Flexibility is provided in all degree programs through electives so that the individual may emphasize areas of personal interest.

Others — The Bachelor of Aviation Management degree (administered by the Aerospace Engineering Department) provides education for management careers with the airlines, general aviation, airports, and other industries.

The Textile Engineering Department administers curricula leading to the degrees of Bachelor of Textile Engineering and Bachelor of Textile Chemistry. These programs are designed to prepare one for a career in one of the many facets of the textile industry.

Two curricula in Computer Science and Engineering are available: Bachelor of Science in Computer Science and Bachelor of Computer Engineering.

The Bachelor of Science in Forest Engineering is offered jointly by the Agricultural Engineering Department and the Forestry Department, both in the School of Agriculture. The curriculum combines professional courses in engineering and forestry for students who want careers in forest industries that require training in both engineering and forestry.

Dual-Degree — The School of Engineering has completed agreements with several predominantly liberal arts institutions to offer a three-two program which results in two college degrees. The broad background provided by this program enables the student to cope more effectively with many of the problems of modern-day society.

The first three years would be devoted to earning a major in any one of the disciplines offered by that college while completing the basic sciences and mathematics required for pre-engineering. Upon completion of three years at the "first college" the student transfers to the School of Engineering and, after approximately two years study in an engineering curriculum, receives a baccalaureate degree from the "first college" and an Engineering baccalaureate degree from Auburn.

Dual degree agreements have also been completed between the School of Engineering and the Auburn University Schools of Agriculture, Arts and Sciences, and Business.

For additional information concerning the Dual Degree Program, contact the Dean of Engineering.

Graduate — Master of Science degrees are offered in Aerospace Engineering, Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering. In addition, there are two professional degrees, Master of Industrial Engineering and Master of Mechanical Engineering. The Doctor of Philosophy degree is offered in Aerospace Engineering, Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering. For requirements for these degrees, see the *Graduate School Bulletin*.

Humanistic-Social Studies Requirements

In addition to being specialists in their own fields, engineers must also be acquainted with the humanities, be aware of the social implications of their activities, and be equipped to assume responsibilities in these areas. To assist them in this preparation, degree requirements include approximately 20 quarter-credit hours of humanistic-social studies in addition to the specified courses in English Composition and History. The courses are either prescribed, elective, or a combination, depending upon the specific engineering curriculum.

The electives must be selected with care since all students must eventually complete *at least one humanities and one social science course*. It cannot be overemphasized that the selection should include some advanced-level courses rather than unrelated, beginning courses. The approved elective sequences are as follows:

HUMANITIES

Architecture: 360, 370; **English:** Any course in literature; **Foreign Language:** All courses; **History:** All courses of 200-level or higher except 204, 205, 206; **Music:** 251, 252, 253, 311, 312, 351, 352, 353, 372, 373, 374; **Philosophy:** All courses; **Religion:** All courses; **Speech Communication:** 230, 235, 320, 333, 335; **Theatre:** 302, 361, 362, 371, 372, 373, 374, 441, 471, 472; **University Courses:** 270, 271, 272.

SOCIAL SCIENCES

Anthropology: All courses; **Economics:** 200, 202, 206, 340, 350, 360, 433; **Family and Child Development:** 267, 269, 270; **Geography:** 215, 302, 303, 304, 305, 306, 307, 308; **Political Science:** All courses; **Psychology:** 211, 212, 213, 302, 420, 431, 561 (not approved for Industrial Engineering); **Sociology:** 201, 202, 204, 301, 304, 409; **Speech Communication:** 200, 273, 326; **University Courses:** 275, 305.

Additional Information

Military Training — All curricula in the School of Engineering permit the use of some basic and advanced ROTC. For these options, see the specific curriculum.

Cooperative Education — The Cooperative Education Program is offered in all curricula of the School of Engineering. Refer to page 40 for a brief description of the program and write to the Director, Cooperative Education, Auburn University, Alabama 36849, for a booklet which gives additional information.

Extension — The Engineering Extension Service helps to extend the resources of the School of Engineering to the people, businesses, and industries of the state. Most of the programs of this expanding service are short courses, conferences, workshops, and seminars. For further information, write to the Director, Engineering Extension Service, 107 Ramsay Hall.

Videotape-Based Off-Campus Courses — The School of Engineering offers graduate-level courses for credit and non-credit to off-campus students through its Office of Continuing Engineering Education. Graduate-level courses are videotaped in the classroom on the Auburn campus and mailed to off-campus students on the same day. Students enrolled in the program are required to do the same homework assignments and take the same exams as the on-campus students enrolled in the course. For information on admission to the program, fees, course offerings and other particulars, write to the Assistant Dean of Engineering for Off-Campus Instruction, Office of Continuing Engineering Education, 107 Ramsay Hall, Auburn University, AL 36849-3501 or call (205) 826-4370.

Pre-Engineering

Scholastic Requirements — Pre-Engineering students are transferred to the curriculum of their choice in the School of Engineering upon meeting the following requirements:

1. Complete all appropriate freshman courses;
2. Earn an overall grade point average on all required and approved elective course work as follows: 2.1 for Aviation Management, 2.4 for Chemical Engineering, 2.8 for Computer Science and Computer Engineering; 2.0 for Textile Management and Technology; 2.2 for all other curricula. *EE 2.6*
3. Be recommended by the Curriculum Admissions Committee.

A student who has not met the above criteria after six resident quarters may not continue to register in Pre-Engineering. Junior standing will not be granted to any student in the Pre-Engineering Program.

Curricula Designations are as follows: PNM for Aviation Management; PTN for Textile Engineering, Textile Chemistry and Textile Management and Technology; PCN for Chemical Engineering; and PN for all other curricula.

The Pre-Engineering curriculum shown below is uniform for Aerospace, Civil, Electrical, Industrial, Materials, and Mechanical Engineering. All other curricula have separate freshman year requirements.

Pre-Engineering Curriculum (PN)

FRESHMAN YEAR											
First Quarter				Second Quarter				Third Quarter			
MH	161	An. Geom. & Cal.*	5	MH	162	An. Geom. & Cal.	5	MH	163	An. Geom. & Cal.	5
CH	103	Fund. Chem. I.	4	CH	104	Fund. Chem. II.	4	PS	220	Gen. Physics I.	3
CH	103L	Gen. Chem. Lab.	1	CH	104L	Gen. Chem. Lab.	1	PS	220L	Gen. Physics Lab. I.	1
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3
HY		History†	3	HY		History†	3	HY		History†	3
IE	102	Graph. Comm. & Des.	2			Free Elective††	2			Hum.-Soc. Elective	3

*Students not prepared for Mathematics 161 are enrolled in Mathematics 160.

†See History Requirements page 12.

††Suggested Free Electives: basic shop courses (IE 111, 112, 113) or Physical Education.

Basic ROTC may be substituted for two hours of Free Electives and one hour of Humanistic-Social Electives.

Department of Aerospace Engineering

The Aerospace Engineering curriculum provides a background for students entering many areas of today's scientific and technological fields. The first two years of study are devoted to the basic subjects of mathematics and physical sciences. The last two years deal with such areas as aerodynamics, design, astrodynamics, propulsion, structures, and flight dynamics. In support of these areas, courses in advanced mathematics, computer programming (both digital and analog), and systems analysis are offered. The methods of systematic problem analysis are stressed. The theory taught in classroom lectures is experimentally verified in laboratory sessions. During the senior year students may take technical electives in several fields of specialization. The Aerospace Engineering Curriculum also serves as a background for graduate study and research.

Curriculum in Aerospace Engineering (AE)

FRESHMAN YEAR			
(See Pre-Engineering Curriculum)			
SOPHOMORE YEAR			
First Quarter			
MH	264	An. Geom. & Cal.	5
ME	205	Applied Mechanics	4
		Statics	4
PS	221	Gen. Physics II.	3
PS	221L	Gen. Physics Lab. II.	1
AE	203	Aerospace Fund.	3
		Free Elective†	1
Second Quarter			
ME	321	Dynamics I.	4
PS	222	General Physics III.	3
PS	222L	Gen. Physics Lab. III.	1
MH	265	Linear Diff. Equatns.	3
		Hum.-Soc. Elect.*†	5
Third Quarter			
EE	302	Intr. to Elect.	3
		Engr. I.	3
ME	301	Thermodynamics I.	4
AE	300	Aerospace Analysis I.	3
ME	207	Strength of Matis. I.	3
		Hum.-Soc. Elect.*	3
JUNIOR YEAR			
AE	307	Aerosp. Structures I.	5
AE	310	Aerosp. Analysis II.	4
EE	301	Engr. Instrumtn.	3
ME	340	Fluid Mechanics I.	3
		Hum.-Soc. Elect.*	3
AE	302	Airloads	4
AE	303	Theor. Aerodynam. I.	4
AE	326	Fund. of Aero-space Dynamics	3
AE	311	Aerosp. Materials & Methods of Construction	2
EHA	304	Tech. Writing**	3
SENIOR YEAR			
AE	439	Static Stability & Control	4
AE	534	Aero. Sys'tms Anal.	3
AE	305	Flight Performance	3
AE	401	Aerosp. Problems	1
		Tech. Elective**	5
		Hum.-Soc. Elect.*	3
AE	500	Viscous Aerodynam.	4
AE	532	Astrodynamics I.	3
AE	541	Dyn. Stab. & Control	3
AE	448	Aero. Design I.	1
		Tech. Elective	6
AE	529	Aircraft Vibration and Flutter	4
AE	533	Astrodynamics II.	3
AE	449	Aero. Design II.	2
		Technical Elective	6
		Hum.-Soc. Elect.*	3

TOTAL — 208 QUARTER HOURS

*See section on Humanistic-Social Electives.

**Advanced ROTC may be substituted for EHA 304 and 3 hours of Technical Electives.

†Basic ROTC may be substituted for 1 hour of free elective and 2 hours of Hum.-Soc. electives.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

AE 491 Special Problems	1-5	AE 545 Missile Aerodynamics	3
AE 501 Adv. Three-dimensional Aerodynamics	3-5	CHE 540 Nuclear Engineering	5
AE 508 Intr. to Computational Fluid Dynamics	5	EE 371 Electronics	3
AE 514 Equilibrium Gas Dynamics	3	IE 410 Probability & Statistics	5
AE 516 Rocket Propulsion I	3	ME 303 Thermodynamics III	3
AE 517 Rocket Propulsion II	3	ME 501 Statistical Thermodynamics	3
AE 520 Dynamic Simulation	3	ME 521 Heat Transfer	4
AE 521 Flight Vehicle Stress Analysis	3	ME 522 Transport Phenomena	3
AE 524 Nonequilibrium Gas Dynamics	3	ME 543 Photoelastic Stress and Strain Analysis	3
AE 528 Space Propulsion Systems	5	MH 503 Engineering Mathematics II	5
AE 535 Elements of VISTOL Flight	3	MH 506 Elementary Partial Diff. Equations	3
AE 536 Rotary Wing Aerodynamics	3	MH 560 Introduction to Numerical Analysis	5
AE 542 Automatic Stability and Control	3	MH 561 Numerical Matrix Analysis	5
AE 543 Flight Simulation	3		

Aviation Management

The Aviation Management curriculum provides the graduate with a technical management background with specialization in aviation leading to careers with the airlines, aircraft manufacturers and airports as well as many other segments of the aviation industry. Information regarding awards, scholarships, internships, and aviation management student organizations is available through the Program Coordinator.

ALTERNATIVE AREAS OF CONCENTRATED STUDY

While there is only one Aviation Management curriculum, there are other major fields of concentration within the basic program. These are Professional Flight Management, Airway Science Management, Management in Aircraft System, and Rotary Wing Flight Operations. Descriptions follow:

PROFESSIONAL FLIGHT MANAGEMENT (PFM) → AM F

Requires flight education and training through either Certificated Flight Instructor rating or Multi-Engine rating. The PFM develops competence in flight in preparation for a flight operation career with the airlines; a corporation flight department, a flight instructor. Special fee required for the flight training courses.

AIRWAY SCIENCE MANAGEMENT (ASM) → AM A

Follows an approved selection of professional electives prescribed by the Federal Aviation Administration for a career in air traffic control.

MANAGEMENT IN AIRCRAFT SYSTEM (MAS) → AM S

Established and approved by the Federal Aviation Administration to provide for a career as a Flight Safety Inspector. Requires flight education and training beyond that for the PFM. Special fees required for flight training courses.

ROTARY WING FLIGHT OPERATIONS (RWFO) → AM R

Provides for rotary wing flight training for selected Army ROTC students. Enables advanced placement in the Army Rotary Wing Flight training for those who successfully complete the syllabus.

Those individuals who are interested in registering in any of the foregoing major fields are advised to contact the Program Coordinator, Aviation Management in the Department of Aerospace Engineering as soon as that decision is made so proper counseling can be provided.

Curriculum in Aviation Management (AM) — AM N

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 160	Pre-Cal.	5	MH 161	An. Cal.	5	AM 200	Aero. Prob.	5
EH 101	English	3	EH 102	English	3	EH 103	English	3
HY 204	History	3	HY 205	History	3	HY 206	History	3
GY 102	World Geog.	5	PG 211	Psychology	5	EC 200	Economics I	5
AM 101	Intr. Avn.	3	IE 102	Engr. Draw.	2			

SOPHOMORE YEAR

AM 201	Elem. Aero.	5	SC 211	Speech	5	IE 220	Statistics	5
MN 207	Intr. Comp.	3	AE 203	Aero. Fund.	3	MT 241	Bus. Law	4
PS 205	Physics	4	PS 206	Physics	4	CH 103	Chemistry	5
EC 202	Economics II	5	ACF 211	Accounting	4	ACF 212	Accounting	4

JUNIOR YEAR

AM 309	Recip. Eng.	3	AM 310	Jet Prop.	3	AM 313	Veh. Systems	5
AM 305	Meteorology	5	AM 312	Air Nav. Cntrl.	3	AM 314	Opnl. Prob.	5
MN 310	Princ. Mgmt.	4	IE 320	Engr. Econ.	5	AM 337	Air Trans.	5
EC 360	Money & Bank.	5	EHA 304	Tech. Writing	3		Prof. Elective	3
				Prof. Elective	4			

SENIOR YEAR

AM 403	Gen. Avn.	3	AM 409	Aero. Leg.	3	AM 401	Aero. Sem.	1
MN 442	Pers. Mgmt.	4	AM 413	Apt. Mgmt.	3	AM 417	Airline Opns.	5
PG 561	Indus. Psy.	5		Prof. Elective	6		Prof. Elective	5
MN 500	Labor Relat.	5		Prof. Elective	6		Prof. Elective	6

TOTAL — 209 QUARTER HOURS

Twelve hours of ROTC (Basic 6; Advanced, 6) may be substituted for SC211 (5 hours) GY 102 (5 hours) and 2 hours of professional electives.

SUGGESTED PROFESSIONAL ELECTIVES

COURSES OTHER THAN THOSE LISTED BELOW MAY BE USED AS

PROFESSIONAL ELECTIVES ONLY UPON APPROVAL BY THE HEAD OF THE DEPARTMENT

AVIATION MANAGEMENT

AM 215	Prin. Pvt. Flt. I	3
AM 216	Prin. Pvt. Flt. II	3
AM 217	Pvt. Flt. Trn. I	1
AM 218	Pvt. Flt. Trn. II	1
AM 404	Gen. Avn. Opns	3
AM 405	Avn. Safety	2
AM 414	Aprt. Planning	3
AM 418	Intl. Airlines	3
AM 419	Air Traf. Control	5
AM 420	Air Cargo Opns	3
AM 421	Cmtr. Airline	3

ECONOMICS COURSES

EC 433	Law & Econ.	5
EC 551	Inter. Micro.	5
EC 552	Comp. Econ. Sys.	5
EC 553	Econ. of Grwth.	5
EC 555	Indust. Organs.	5
EC 556	Inter. Micro.	5
EC 562	Inter. Monetary	5
EC 565	Public Fin.	5
EC 571	Intl. Econ.	5

ENGLISH COURSES

EHA 315	Bus. & Prof. Writ.	3
EHA 415	Wrtng. Bus. Comm.	3
EHA 416	Appl. Writing	3

MANAGEMENT COURSES

MN 305	Adv. Comp. Pgm.	4
MN 307	Bus. Comp. Apl.	4
MN 380	Prn. Opr. Mgmt.	4
MN 381	Mng. Dec. Mkg.	5
MN 382	Mng. Info. Sys.	4
MN 385	Prod. Mng.	5
MN 386	Mtrls. Mng.	5
MN 415	Sml. Bus. Mng.	5
MN 420	Appl. Bus. Mng.	5
MN 447	Employee Comp.	4
MN 501	Labor Law	5
MN 502	Labor Negot.	4
MN 503	Labor Arbit.	3

MARKETING COURSES

MT 241	Bus. Law II	4
MT 255	Leg. Env. Bus.	4
MT 331	Prin. of Mkt.	5
MT 336	Quan. Anal. Mkt.	5
MT 341	Conmr. Behv.	5
MT 344	Envrn. Law	4
MT 432	Prom. Strategy	5
MT 436	Mkt. Res. Meth.	5
MT 440	Intr. Mktg.	5

SOCIOLOGY COURSES

SC 507	Public Opn. & Prop.	5
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INDUSTRIAL ENGINEERING

IE 305	Inf. Dec. Sys.	3
IE 330	Decision Anly.	5
IE 346	Ergonomics	4

COMPUTER SCIENCE

CSE 350	Assembly Lang.	3
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CIVIL ENGINEERING

CE 201	Surveying	5
CE 350	Trans. Engr.	3
CE 450	Traf. Engr. Fund.	3
CE 452	Airport Dsgn.	3
CE 524	Air Pollution	5
CE 536	Pavement Mtrl.	3

ACCOUNTING COURSES

ACR 213	Cost Acct.	4
ACF 311	Inter. Acct. I	5
ACF 312	Inter. Acct. II	5
ACF 320	Risk & Insur.	5
ACF 323	Real Estate	5
ACF 361	Prn. Bus. Fin.	5
ACF 363	Adv. Bus. Fin.	5
ACF 410	Cost Acct.	5

Department of Agricultural Engineering

The Agricultural Engineering curriculum provides the graduate with engineering skills necessary to serve the nation's largest industry — agriculture. In addition to a strong background in mathematics, physical sciences, and basic engineering fundamentals, the student of agricultural engineering receives training in biological and agricultural sciences. Through technical electives in the senior year, one can specialize in one or more areas to include soil and water conservation, power and machinery design, electric power and processing, agricultural structures and environment, food engineering and waste management and agricultural pollution control.

The curriculum is coordinated by the School of Engineering and the School of Agriculture. Students register in the School of Agriculture. A student in the pre-engineering program can transfer without loss of credit.

Curriculum in Agricultural Engineering (AN)

FRESHMAN YEAR

First Quarter

MH	161	An. Geom. & Cal.	5
CH	103	Fund. Chem. I	4
CH	103L	Gen. Chem. Lab.	1
EH	101	English Comp.	3
HY	101	or 204, History	3
IE	102	Graphic Communication & Design	2

Second Quarter

MH	162	An. Geom. & Cal.	5
CH	104	Fund. Chem. II	4
CH	104L	Gen. Chem. Lab.	1
EH	102	English Comp.	3
HY	102	or 205, History	3
AN	101	Orient. to Ag. Engr.	1

Third Quarter

MH	163	An. Geom. & Cal.	5
PS	220	General Physics I	3
PS	220L	Gen. Physics I Lab	1
CSE	204	Intr. Computer Prog.	3
EH	103	English Comp.	3
HY	103	or 206, History	3

SOPHOMORE YEAR

AN	201	Ag Engr. Principles	5
MH	264	An. Geom. & Cal.	5
ME	205	Applied Mechanics-Statics	4
PS	221	General Physics II	3
PS	221L	Gen. Physics II Lab	1

AEC	202	Ag. Economics I	5
ME	207	Strength of Matrs	3
MH	265	Linear Diff. Equatns	3
PS	222	General Physics III	3
PS	222L	Gen. Physics III Lab	1
		Hum.-Soc. Elective*	3

BI	101	Prin. of Biology	5
ME	301	Thermodynamics I	4
ME	321	Dynamics I	4
MH		Math Elective	3

JUNIOR YEAR

AY	307	General Soils	5
EE	302	Intr. to Elect. Engr. I	3
EE	330	Analysis & Design of Logic Circuits	4
CE	310	Hydraulics I	3
SC	202	Appld. Speech Comm. or	
EHA	304	Technical Writing	3

AN	311	Ag. Machinery & Power Units	5
AN	315	Ag. Processing & Food Engineering	5
ME	316	Strength of Matrs II	4
EE	303	Intr. to Elec. Engr. II	3
AN	420	Seminar	1

AN	313	Conservtn. & Water Mgt. Engineering	6
AN	317	Environm. of Ag. Structures & Waste Mgt.	6
AN	316	Elec. Systems in Ag.	5

SENIOR YEAR

AN	403	Ag & Forest Structures Design	3
		Ag Elective	5
		Engr. Science Elective	5
		Hum.-Soc. Elective*	3

AN	430	Ag & Forest Engr. Design I	3
IE	360	Engr. Econ. Analysis	3
		Ag. Elective	5
		Technical Elective	7

AN	530	Ag. & Forest Engr. Design II	3
		Hum.-Soc. Elective*	9
		Technical Elective	6

TOTAL — 210 QUARTER HOURS

*Selected from Anthropology, Art, Economics, History, Literature, Philosophy, Political Science, Psychology, Religion, Sociology, Theatre.

A list of recommended electives is available in the offices of the adviser and Dean. Electives must be approved by them.

Basic ROTC may be substituted for three hours of Humanistic-Social Science electives.

Advanced ROTC may be substituted for SC 202 (3 hours) or EHA 304 (3 hours) and three additional hours approved by the Department Head.

Department of Chemical Engineering

The program leading to the bachelor's degree in chemical engineering consists almost entirely of the study of broad scientific and engineering principles which have numerous applications in the chemical and related industries. It is excellent preparation for specialized education in biochemical, biomedical, environmental, and nuclear engineering. Those students who elect to continue their education through one or more advanced degrees are qualified for better positions and often make more rapid progress than those with only the bachelor's degree.

The broad university training provided, when supplemented by professional experience, enables graduates to qualify for positions as engineers in production, research and development, sales engineering, plant design, and management in the chemicals industry and in a wide range of related industries — petroleum, plastics, metals, paper, pharmaceuticals, and many others.

Curriculum in Chemical Engineering (CHE)

FRESHMAN YEAR

First Quarter

MH	161	An. Geom. & Cal.	5
CH	111	General Chem.†	5
EH	101	English Comp.	3
HY		History*	3
IE	102	Graphic Meth.**	2

Second Quarter

MH	162	An. Geom. & Cal.	5
CH	112	General Chem.†	5
EH	102	English Comp.	3
HY		History*	3

Third Quarter

MH	163	An. Geom. & Cal.	5
CH	113	General Chem.	5
EH	103	English Comp.	3
HY		History*	3

SOPHOMORE YEAR

CHE	210	Mass Balances	3
CHE	213	Comp. in Che	3
MH	264	An. Geom. & Cal.	5
PS	220	Gen. Phys.	4
		Free Elect.**	3

CH	211	Energy Balances	4
CH	303	Organic Chem.	5
PS	221	Gen. Phys.	4
MH	265	Diff. Equations.	3
		Hum.-Soc. Elect.	3

CHE	336	Thermo. I	4
CHE	361	Fluid Mech.	4
CH	304	Organic Chem.	5
PS	222	General Phys.	4

JUNIOR YEAR

CH	337	Thermo II	4
CHE	362	Heat Transfer	4
CH	507	Physical Chem.	5
EHA	304	Tech. Writing***	3
		Hum.-Soc. Elective	3

CHE	346	Stagewise Op.	4
CHE	363	Mass Transfer	4
CHE	382	CHE Lab I	3
CH	508	Physical Chem.	5

CHE	326	Reactn. Engr.	4
CHE	586	CHE Lab II	3
EE	300	Fund. El. Eng.	5
		Elective****	4
		Hum.-Soc. Elect.	3

SENIOR YEAR

CHE	516	Process Cont. I	4
CHE	545	Proc. Design I	4
ME	205	Statics	4
CHE	587	CHE Lab III	3
CHE	470	Seminar	1

CHE	517	Proc. Cont. II	4
CHE	546	Proc. Design II	4
		Elective****	4
		Hum.-Soc. Elect.	6

CHE	518	Proc. Cont. Lab	2
CHE	547	Proc. Design III	4
		Hum.-Soc. Elect.	5
		Elective****	7

TOTAL — 210 QUARTER HOURS

*As needed to satisfy University history requirement.

**Basic ROTC (6 hrs.) may be substituted for IE 102, Free Elective, and one hour of Elective.

***May be replaced by Advanced ROTC.

****Electives total 15 hours and must be selected as below:

One course from CH 305, 509, 510, 515, or 518.

Two courses from CHE Electives (listed in CHE Dept.).

One hour may be replaced by one hour of Basic ROTC.

Three hours may be replaced by three hours of Advanced ROTC.

Additional courses from list of approved technical electives (listed in CHE Dept.).

†CH 103, 103L and 104, 104L are acceptable substitutes for CH 111 and 112 for students transferring into CHE or PCN.

Department of Civil Engineering

The Civil Engineering curriculum provides a background in mathematics and the physical sciences, in humanistic-social studies, and in the engineering sciences and the inter-related subdisciplines of civil engineering. Technical electives including design electives permit the undergraduate limited specialization in an area of civil engineering such as construction, environmental engineering, soils, structures, transportation, or water resources.

The civil engineer plays an essential role in the realization of some of the most basic goals, objectives, and needs of society. These relate to man's needs for shelter, mobility, water, air, and productive land — the environment in which he lives and works.

Curriculum in Civil Engineering (CE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter

EC	200	Economics I	5
MH	264	An. Geom. & Cal.	5
PS	221	Physics II	3
PS	221L	Physics II Lab	1
CE	202	Intr. to Comp.	4

Second Quarter

MH	269	Diff. Equations	5
PS	222	Physics III	3
PS	222L	Physics III Lab	1
CE	201	Surveying	5
CE	205	Statics	4
CE	200	CE Seminar	1

Third Quarter

ME	301	Thermodynamics I	4
ME	321	Dynamics	4
CE	207	Mech. of Solids	4
CE	301	CE Analysis	3
		Free Elective†	3

JUNIOR YEAR

EE 302	Circuits	3	CE 311	Hydraulics	3	CE 350	Transp. Engr.	3
CE 310	Hydraulics	3	CE 321	Water & Wastewater	3	CE 420	Water Treat.	4
CE 360	Structures I	4	CE 362	Structures II	3	CE 430	Intr. to Soils	5
IE 360	Engr. Econ.	3	CE 303	Statistics	4	CE 465	Steel I.	3
EHA 304	Tech. Writing††	3	GL 315	Geology	4		Hum-Soc. Elec.††	3
			CE 311L	Hydraulics Lab	1			

SENIOR YEAR

CE 421	Wastewater Trt.	4	CE 312	Hydrology	3	CE 440	Con. & Spec.	3
CE 431	Soil & Found.	3		Transp. Elect.*	3		Design Elect.*	3
CE 460	Concrete I.	3		Design Elect.*	3		Tech. Elect.	6
	Tech. Elect.	3		Tech. Elect.	3		Hum-Soc. Elect.*	3
	Hum-Soc. Elect.*	3		Hum-Soc. Elect.*	3			

TOTAL — 207 QUARTER HOURS

*See section on Humanistic-Social Electives. Three hours of Advanced ROTC may be substituted for three hours of Humanistic-Social Electives.

**Design elective must be selected from the approved list.

†Three hours of Basic ROTC may be substituted.

††Three hours of Advanced ROTC may be substituted.

TECHNICAL ELECTIVES

A list of suggested technical electives may be obtained in the departmental office. Any selection not on the list must be approved by the Head of the Department.

Computer Science and Engineering

Computer Science — The Computer Science curriculum, leading to the degree Bachelor of Science in Computer Science, is a liberal-arts oriented curriculum intended to prepare students for careers in programming and systems analysis as well as for graduate work in Computer Science. The curriculum is designed to meet general Auburn University requirements as well as the recommendations of the Association for Computing Machinery and the IEEE Computer Society.

Curriculum in Computer Science (CS)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 161	An. Geom. & Cal.*	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
CH 103	Fund. Chem. I	4	CH 104	Fund. Chem. II	4	PS 220	General Physics I	3
CH 103L	Gen. Chem. Lab.	1	CH 104L	Gen. Chem. Lab.	1	PS 220L	Gen. Physics Lab. I	1
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	or 204 History	3	HY 102	or 205 History	3	HY 103	or 206 History	3
IE 102	Graphic Communication & Design	2		Free Elective†	2	CSE 200	Intr. to Computers & Programming	4

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
FL	Foreign Language***	5	FL	Foreign Language***	5	FL	Foreign Language***†	5
MH 264	An. Geom. & Cal.	5	MH 265	Linear Diff. Equatns.	3	EE 330	Analysis & Design of Logic Circuits	4
PS 221	General Physics II	3	PS 222	General Physics III	3	CSE 340	Comptr. Based Data Structures	3
PS 221L	Gen. Physics Lab II	1	PS 222L	Gen. Physics Lab III	1	MH 266	Linear Algebra	3
CSE 220	Fund. of Structured Programming	4	CSE 230	File Management	4		Minor	3
				Minor	3			

JUNIOR YEAR

First Quarter			Second Quarter			Third Quarter		
MH 371	Discrete Math for Computer Science	3	PO 209	Intr. Amer. Govt., or		CSE 305	Intr. Sftwr. Engr.	3
EE 335	Comptr. Organiztn. & Assembly. Lang. Prog.	4	PO 210	St. & Local Govt.	5	CSE 360	Fund. Algorithms	3
SY 201	Intr. Sociology	5	EE 430	Comptr. Syst. Design	4	IE 311	Engr. Statistics	3
	Minor	3	CSE 350	Assembly. Lang. Prog.	3		Literature*	3
				Literature*	3		Minor	3
				Minor	3		Free Elective†	2

SENIOR YEAR

CSE 500	Syst. Programng. I	3	CSE 530	Comptr. Arch. & Design	4	MH 560	Numerical Anal., or	
CSE 520	Formal Theory of Computer Languages	3	CSE 511	Database Mgt. Syst.	3	MH 561	Num. Matrix Anal.	5
	Literature*†	3	CSE 501	Systems Prog. II	4	CSE 521	Compiler Constructn.	4
	Minor	6		Minor	6		Minor	3
							CSE Elective††	3

TOTAL — 207 QUARTER HOURS

*Students not prepared for MH 161 must begin with MH 160.

††One year of the same language.

†Basic ROTC (six hours) may be substituted for three hours of Free Electives and three hours of Literature; Advanced ROTC (six hours) may be substituted for one hour of Free Electives and five hours of Foreign Languages.

††Selected from an approved list obtained from the CSE Department Office.

*EH 253-254-255, or 260-261-262, or 250-251.

Minor — Concentration outside of Computer Science; minimum of 30 hours in one general area of concentration. Individual programs, developed by the student and the CSE adviser, are approved by the CSE adviser and the heads of the departments offering the courses. Suggested, but not limited to, areas of concentration are Business, Mathematics, Science, Engineering, and select areas of Agriculture.

Computer Engineering — The Computer Engineering curriculum, leading to the degree Bachelor of Computer Engineering, is a design-oriented curriculum intended to prepare students for careers in logic design, systems programming, and integration of computer systems, as well as for graduate work. It is based on the IEEE Computer Society Model Curriculum for Computer Engineering.

Curriculum in Computer Engineering (CPE)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
CH 103	Fund. Chem. I	4	CH 104	Fund. Chem. II	4	PS 220	General Physics I	3
CH 103L	Gen. Chem. Lab.	1	CH 104L	Gen. Chem. Lab.	1	PS 220L	Gen. Physics Lab I	1
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	or 204 History	3	HY 102	or 205 History	3	HY 103	or 206 History	3
IE 102	Graphic Communi- cation & Design	2		Free Elective†	2	CSE 200	Intr. to Computers & Programming	4

SOPHOMORE YEAR

EC 200	Economics I	5	ME 205	Applied Mechanics — Statics	4	EE 263	Circuit Analysis II	4
MH 264	An. Geom. & Cal.	5	PS 222	General Physics III	3	EE 264	Circuit Anal. II Lab	1
PS 221	General Physics II	3	PS 222L	Gen. Physics Lab III	1	EE 330	Analysis & Design of Logic Circuits	4
PS 221L	Gen. Physics Lab II	1	CSE 230	File Management	4	CSE 340	Computer-Based Data Structures	3
CSE 220	Fund. of Struc- tured Programming	4	EE 261	Linear Circuit Anal.	3	MH 266	Linear Algebra	3
			MH 265	Linear Diff. Equatns	3		Hum.-Soc. Elective	3

JUNIOR YEAR

MH 371	Discrete Math for Computer Science	3	EE 430	Comptr. Syst. Design	4	CSE 305	Intr. Sftwr. Engr.	3
EE 335	Comptr. Organizatn & Assembly Lang. Prog.	4	ME 301	Thermodynamics I, or Dynamics I	4	EE 362	Linear Systems, or	
EE 371	Electronics I	3	CSE 350	Assembly Lang. Prog.	3	IE 411	Operatns. Research	5
PS 320	Modern Physics	3	IE 311	Engr. Statistics	3	CSE 360	Fund. Algorithms	3
	Hum.-Soc. Elective††	3		Hum.-Soc. Elective	3	EHA 304	Technical Writing††	3
						IE 360	Engr. Econ. Analysis	3

SENIOR YEAR

CSE 500	Syst. Programng. I	3	CSE 530	Comptr. Arch. & Design	4	CSE 521	Compiler Constructn.	4
CSE 520	Formal Theory of Com- puter Languages	3	CSE 511	Database Manage- ment Systems	3		Elective†††	6
	Electives	6	CSE 501	Syst. Programming II	4		Hum.-Soc. Elective	3
	Technical Elective†	3		Hum.-Soc. Elective	3		Technical Elective†††	3
				Technical Elective	3			

TOTAL — 207 QUARTER HOURS

*Students not prepared for MH 161 must begin with MH 160.

†Basic ROTC (six hours) may be substituted for four hours of Technical Electives and two hours of Free Electives.

††Advanced ROTC (six hours) may be substituted for EHA 304 (three hours) and three hours of Humanistic-Social Electives.

†††Selected from an approved list obtained from the CSE Department office.

Department of Electrical Engineering

The Electrical Engineering curriculum is a carefully formulated program designed to prepare its graduates for the practice of engineering at a professional level in an era of rapid and challenging technological development. It is accredited by the Accreditation Board for Engineering and Technology (ABET).

Fundamental to the program is a broad liberal education base of humanistic — social studies which are intended to impart a sense of social awareness and responsibility, tempered by humanistic values. An extensive program of study in basic sciences and mathematics provides the physical understanding and analytical tools which are requisite for the study of engineering.

The professional portion of the curriculum draws heavily from other engineering disciplines to provide a broad engineering science base in such fundamental engineering subjects as mechanics, thermodynamics, strength of materials and engineering economy. The curriculum major — electrical engineering — emphasizes seven basic areas of study. These are: circuit analysis, communications, controls, digital systems, electronics, electromagnetics, and power systems. Technical electives in the senior year provide flexibility in the curriculum to accommodate a diversity of interests and talents. A student, through choice of technical electives, can pursue deeper study in a particular subject area or choose a variety of courses to maintain a broad program. Electives must be selected from an approved list which is provided by the student's counselor.

The curriculum places strong emphasis on the importance of hands-on laboratory experience, knowledgeable use of digital computer systems, oral and written communications skills, and the development of an ability to maintain professional competence through continued self-study after graduation.

Curriculum in Electrical Engineering (EE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH	264	An. Geom. & Cal.5	MH	265	Linear Diff. Eq.3	MH	266	Linear Algebra3
PS	221	Gen. Physics II3	PS	222	Gen. Physics III3	PS	320	Mod. Physics for
PS	221L	Gen. Physics Lab. II . . .1	PS	222L	Gen. Physics Lab. III . . .1	Engr.3		
EE	201	Intr. to Comp. Prog. . . .3	EE	261	Linear Circuit An. I . . .3	EE	263	Linear Circuit An. II . . .4
ME	205	Appl. Mech.-Statics . . .4	ME	321	Dynamics I4	EE	264	Lin. Cir. An. II Lab. . . .1
		Hum.-Soc. Elective* . . .3	EE	330	An. & Des. Logic Cir. . .4	EE	391	Electromag. Prin. I . . .3
						IE	311	Engr. Statistics I3

JUNIOR YEAR

ME	207	Strength of Mtl's. I3	EE	340	Communications I3	EE	341	Communications II4
EE	335	Comp. Org. and	EE	374	Electronics II4	EE	351	Lin. Feedback Sys. . . .4
		Assy. Lang. Prog.4	EE	430	Comp. Sys. Design . . .4	EE	385	Power Sys. An. I4
EE	362	Linear Systems5	EE	492	Appl. Electromag. . . .4	EE	475	Electronics III5
ME	371	Electronics I3			Hum.-Soc. Elective* . . .3			
EE	392	Electromag. Prin. II . . .3						

SENIOR YEAR

IE	360	Engr. Econ. Analysis . . .3	EHA	304	Tech. Writing3			Tech. Elective*10
EE	352	Diacr. & Nonl. Sys. . . .4	ME	301	Thermodynamics I . . .4			Hum.-Soc. Elective* . . .6
EE	481	Energy Conversion5	EE	489	Energy Conv. Lab. . . .2			
		Tech. Elective*4			Tech. Elective*4			
					Hum.-Soc. Elective* . . .5			

TOTAL — 210 QUARTER HOURS

Basic ROTC may be substituted for ME 207. Advanced ROTC may be substituted for IE 360 and three hours of technical electives.

*Humanistic-Social Electives and Technical Electives must be selected from approved lists which may be obtained from the electrical engineering undergraduate counselor. A minimum of three technical elective courses must be approved EE "Design" courses. The "Design" component of the technical electives is non-substitutable.

Department of Industrial Engineering

Industrial Engineering differs from other branches of the engineering profession in three basic ways. First, it covers all types of industrial, commercial, and service activity. Second, it gives substantial emphasis to the role of people as well as machines and materials in systems design. Third, it becomes heavily involved in the economic and financial aspects of the problems it considers. While the Industrial Engineer is still concerned with production systems, many non-industrial organizations have recognized the value of Industrial Engineering techniques, and Industrial Engineers are practicing in health, marketing, financial, governmental, military, transportation, educational, agricultural, and consulting organizations. Furthermore, they have increasingly become involved in interdisciplinary activities.

The Industrial Engineering curriculum emphasizes the systems approach to design, operation, and control, and provides the student with competencies in quantitative and qualitative analysis and solution procedures to the resource utilization, data processing, information flow, management, economic, and human factors problems associated with almost any system. The curriculum includes departmental courses in the areas of: computer systems and programming, simulation, mathematical optimization methods, probability and statistics, operation research, production processes, facilities design, human performance, and the design of man's work environment and work methods. An elective program equivalent to approximately two quarter's course work permits the student to pursue further topics of personal and professional interest.

A wide variety of employment opportunities is available to the Industrial Engineer since his competencies are required by almost all manufacturing and service organizations. Additionally, industrial engineering is excellent training for top management positions.

Curriculum in Industrial Engineering (IE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH	264	An. Geom. & Cal.5	EC	200	Economics I5	EHA	304	Tech. Writing*3
PG	211	Gen. Psychology5	PS	222	Gen. Physics III3	IE	305	Info. Decision Syst.3
PS	221	Gen. Physics II3	PS	222L	Gen. Physics Lab III1	IE	311	Engr. Statistics I3
PS	221L	Gen. Physics Lab II1	IE	300	Computer Prog.3	IE	360	Engr. Econ. Anal.3
IE	202	Engr. Comptn.3	MH	265	Linear Diff.3	MH	266	Linear Algebra3
					Equations3	PS	320	Modern Physics**3
					Basic ROTC or			
					Elective3			

JUNIOR YEAR

IE	323	Engr. Statistics II5	IE	346	Ergonomics I4	EE	263	Circuit Analysis II4
PG	321	Exp. Psych. II: Perception5	IE	347	Ergonomics I Lab1	IE	406	Ergonomics II3
ME	301	Thermodynamics I4	IE	333	Engr. Statistics III4	IE	407	Ergonomics II Lab1
IE	342	Linear Programming3	IE	352	Deterministic Optms. Research Models3	IE	412	Stochastic Optms. Research Models3
					Hum.-Soc. Elective†2	IE	390	Seminar1
			EE	261	Linear Circuit Anal.3			Tech. Elective4

SENIOR YEAR

IE 422	Production Control Functions I	4	IE 425	Prod. Cont. Func. II	3	ME 321	Dynamics	4
ME 205	Statics	4	IE 427	Oper. & Fac. Design I	3	IE 428	Operatns. & Facilities Design II	3
IE 416	Simulation	3	ME 207	Strength of Matis. I	3		Free Elective*	3
IE 460	Intermed. Engr. Economic Analysis	3		Tech. Elective	7		Tech. Elective	6
	Tech. Elective	3						

TOTAL — 206 QUARTER HOURS

*Six hours of Advanced ROTC may be substituted for three hours of free electives and EHA 304.

**PS 305 or 570 may be substituted. See departmental policy for details.

†At least one course in the available 5 hours of Hum-Soc. electives in the undergraduate program must be Humanities.

TECHNICAL ELECTIVES

The IE program includes 20 hours of technical electives of which 6 hours must be from courses classified as engineering science. These electives may be selected from the areas of computer science, human performance, operations research and statistics, production systems, engineering management, or engineering methods. A pamphlet describing elective options is available in the IE department office. Typical courses in each area from which the 20 hours may be selected with the consent of the faculty adviser are listed below.

Human Performance

IE 438	Occupational Safety	5	IE 514	Ergonomics VIII: Labor Productivity Assessment	3
IE 502	Systems Analysis for Safety	3	IE 540	Sampling	3
IE 509	Ergonomics III: Work Physiology	3	IE 558	Reliability	3
IE 510	Ergonomics IV: Environmental Work Stress	3	EE 397	Introduction to Acoustics and Noise Control	3
IE 511	Ergonomics V: Occupational Biomechanics	3	PG 320	Experimental Psychology I — Learning	5
IE 512	Ergonomics VI: Data Collection Procedures	3	PG 440	Physiological Psychology	5
IE 513	Ergonomics VII: Design of Non-strenuous Tasks	3	PG 561	Industrial Psychology	5

Production Systems

IE 436	Plant Location	3	IE 575	Project Management	3
IE 543	Inventory Control	3	IE 558	Reliability Engineering	3
IE 560	Materials Handling Systems	3	IE 559	Operational Control System Design	3
IE 561	Advanced Facilities Design	3	IE 556	Intermediate Simulation	3
IE 570	Scheduling	3			

Engineering Methods

AE 300	Aerospace Analysis I	3	EE 330	Logic Circuits	4
AE 302	Airloads	4	ME 302	Thermodynamics II	3
CE 304	Theory of Structures	4	ME 304	Engineering Materials	3
CE 380	Theory of Structures II	5	ME 322	Dynamics	3
CE 315	Engineering Geology	4			

Engineering Management

ACF 215	Cost Accounting	4	MT 434	Purchasing	5
ACF 310	Budgeting	5	PG 561	Industrial Psychology	5
ACF 410	Cost Accounting	5	PG 562	Industrial Personnel	5
EC 560	Introduction to Econometrics	5	IE 543	Inventory Control	3
MT 442	Personnel Management	5	IE 570	Scheduling	3
MT 331	Marketing	5			

Computer Science

CSE 220	Fundamentals of Structured Programming	3	CSE 512	Advanced Data Processing	3
CSE 230	File Management	3	CSE 520	Formal Theory of Computer Languages	3
CSE 300	Structured Programming for Engineers and Scientists	3	CSE 523	Advanced Programming	3
CSE 301	COBOL Programming for Information Systems	3	EE 330	Analysis and Design of Logic Circuits	4
CSE 340	Computer-Based Data Structures	3	EE 335	Computer Organization and Assembly Language Programming	4
CSE 350	Assembly Language Programming	3	EE 430	Computer System Design	4
CSE 360	Fundamental Algorithm Design and Analysis	3	EE 521	Intro. to Artificial Intelligence and Robotics	4
CSE 511	Database Management Systems	3	MH 371	Discrete Mathematics for Computer Science	5
			MH 561	Numerical Matrix Analysis I	5

Operations Research and Statistics

IE 515	Sensitivity Anal. in Op. Research Modeling	3	IE 553	Dynamic Programming	3
IE 540	Sampling and Survey Techniques	3	IE 556	Intermediate Simulation	3
IE 542	Advanced Linear Programming	3	IE 558	Reliability Engineering	3
IE 543	Inventory Control	3	IE 570	Scheduling Theory & Applications	3
IE 550	Search Methods for Optimization	3			

Department of Mechanical Engineering

The basic engineering science fields of engineering mechanics, materials science, thermodynamics, fluid mechanics, and heat and mass transfer are covered in depth in this curriculum to give students understanding and the ability to solve problems in these areas. In addition, there are professional subjects offering instruction in combustion engines, including gas turbines and rockets, power plants, air conditioning, refrigeration, automatic controls, turbomachinery and machine design. A series of courses in electrical subjects is also included to equip the graduate with needed fundamental knowledge in this rapidly expanding field.

Modern design courses at senior level, employing both the group project and the individual project techniques, provide an opportunity for the student to solve typical engineering problems, requiring the development of skill and cooperation in creative design, analysis, and synthesis.

Technical electives are provided in the senior year to enable students to specialize to a limited extent, including a sequence in optimization theory.

Curriculum in Mechanical Engineering (ME)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH 264	An. Geom. & Cal.	5	PS 222	General Physics III	3	ME 301	Thermodynamics I	4
ME 205	Applied Mechanics-Statics	4	PS 222L	Gen. Physics Lab III	1	ME 321	Dynamics I	4
PS 221	General Physics II	3	ME 202	Engr. Materials Science-Structure	3	EE 261	Linear Circuit Anal. I	3
PS 221L	Gen. Physics Lab II	1	ME 207	Strength of Matis. I	3	MH 362	Engr. Math. I	3
	Basic ROTC or Elective	1	MH 265	Linear Diff. Equations	3	ME 309	Correlative Experimental Mechanics	2
	Hum.-Soc. Elective*	3	ME 211	Engr. Methods	2		Basic ROTC or Elect.	1
				Basic ROTC or Elect.	1			

JUNIOR YEAR

EE 263	Linear Circuit Anal. II	4	ME 323	Dynamics of Machs	4	ME 335	Engr. Materials Science-Metallurgy	4
ME 322	Dynamics II	4	ME 302	Thermodynamics II	3	ME 341	Fluid Mechanics II	4
ME 316	Strength of Matis. II	4	ME 304	Engr. Materials Science-Properties	3	ME 303	Thermodynamics III	3
ME 308	Computation Lab	3	ME 340	Fluid Mechanics I	3	PS 320	Modern Phys. for Engrs	3
EHA 304	Technical Writing I	3		Electrical Science Elective**	3	IE 360	Engr. Ec. Anal.	3

SENIOR YEAR

ME 439	Mech. Engr. Design I	4	ME 515	Thermodynamics of Power Systems	4	ME 451	Advanced Projects	3
ME 521	Heat Transfer	4	ME 415	Heat Transfer & Fluid Mech. Lab	2	ME 420	Thermal Systems Laboratory	2
ME 527	Dynamics of Physical Systems	4	ME 442	Compr. Aid Des	3		Hum.-Soc. Elective*	9
ME 412	Measurements Lab	2	ME 522	Transport or Energy Util.	3		Technical Elective	4
	Hum.-Soc. Elective*	2	ME 524	Hum.-Soc. Elective*	3			
	Technical Elective	3		Technical Elective	3			

TOTAL — 210 QUARTER HOURS

†Six hours of Advanced ROTC may be substituted for EHA 304 (3 hrs.) and three hours of Technical Electives.

*See section on Humanistic-Social Electives.

**Electrical Science Elective must be EE 301 Engineering Instrumentation or EE 371 Electronics I.

Materials Engineering

The curriculum in Materials Engineering is administered by the Department of Mechanical Engineering of the School of Engineering. It is an interdisciplinary curriculum conducted cooperatively by academic departments of the School of Engineering and the School of Arts and Sciences through a faculty Materials Engineering Curriculum Committee.

Materials Engineering includes both the design of materials and materials processes to meet specific needs. Materials engineers are employed in the basic metallurgical, ceramics, plastics, electronics, aerospace, mechanical, process, chemical, and nuclear power industries.

The curriculum in Materials Engineering includes the basic sciences, engineering sciences, and particularly the science of the relationship of structure to properties.

Materials Engineering courses include the subjects of ceramic, metallic, and plastic materials design with the emphasis placed upon the structure of each type and its influence on the properties and performance in service. Fundamental relationships are emphasized to prepare the engineer to meet effectively modern design challenges that will be encountered.

Curriculum in Materials Engineering (MTL)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH	264	An. Geom. & Cal. ....5	PS	222	Gen. Physics III .....3	ME	301	Thermodynamics I ....4
PS	221	Gen. Physics II .....3	PS	222L	Gen. Physics Lab. III ...1	MH	362	Engr. Math I .....3
PS	221L	Gen. Physics Lab. II ...1	MH	265	Linear Diff. Equations .3	MTL	304	Engr. Materials
ME	205	Applied Mechanics —	MTL	202	Engr. Materials			Science-Properties ...3
		Statics .....4			Science-Structure ...3	PS	320	Modern Physics for
		Basic ROTC or Elect. .3	ME	207	Strength of Matis, I ...3			Engineers .....3
					Basic ROTC or Elect. .3	EE	261	Linear Circuit Anal. I ...3

JUNIOR YEAR

CH	507	Physical Chemistry ...5	CH	508	Physical Chemistry ...5	MTL	336	Physical Analysis
MTL	335	Engr. Matis. Science-	ME	308	Computation Lab ...3			of Matis. I .....4
		Physical Metallurgy ...4	MTL	338	Phase Diagrams .....4	MTL	550	Thermo. of Matis. Syst. 4
EE	263	Linear Circuit	EHA	304	Tech. Writing† .....3	MTL	515	Polymer Tech. I .....4
		Analysis II .....4			Hum.-Soc. Elective* ...3			Hum.-Soc. Elect.* ...3
		Hum.-Soc. Elective* ...6						Tech. Elective .....4

SENIOR YEAR

MTL	337	Phys. Anal. of Matis. II .4	MTL	435	Phys. Anal. of Matis. III 4	ME	521	Heat Transfer .....4
MTL	516	Polymer Tech. II .....3	MTL	447	Mech. of Engr. Matis. .4	ME	451	Advanced Projects ...3
MTL	536	Engr. Matis. Sci. —	MTL	448	Intr. to Ceramics .....3	MTL	446	Theor. Matis. Engr. ...3
		Ferrous Metallurg ...3	MTL	513	Intr. to x-ray			Hum.-Soc. Elective* ...3
MTL	575	Rate Processes in			Crystallography .....5			Tech. Elective .....4
		Matis. ....3			Hum.-Soc. Elective* ...2			
		Tech. Elective .....4						

TOTAL — 210 QUARTER HOURS

†Six hours of Advanced ROTC may be substituted for EHA 304 (3 hrs.) and three additional hours approved by the Chairman of the Materials Engineering Curriculum Committee.

*See section on Humanistic-Social Electives.

NOTE: The sequence CH 111 and CH 112 may be substituted for the sequence CH 103/CH 103L and CH 104/CH 104L.

SUGGESTED TECHNICAL ELECTIVES

Selected from approved list which can be obtained from the chairman of the Materials Engineering Curriculum Committee.

Department of Textile Engineering

The programs in the Department of Textile Engineering are designed to be sufficiently flexible to serve the needs of the student who seeks a career in the textile industry. Textiles is a truly multi-disciplinary program, and frequently a career in this field will draw on knowledge from the sciences, arts, combinations of these, economics, business and others.

The curricula are planned to provide for the needs of students as perceived by them and assisted by the faculty of the department.

Well equipped laboratories complement the lecture program. These laboratories represent the types of equipment, bench study and research capabilities so vital to the learning of and contributing to a career in the industry.

The size and diversity of textiles and the allied industries provide careers in manufacturing, research, machinery design, chemicals and dyestuffs, sales, styling and design, technical service and others. Too, the student has the opportunity to prepare for graduate school if he or she desires.

For those students who want to plan their education path in conjunction with industrial experience the Alabama textile industry cooperates with the Department of Textile Engineering through the Cooperative Education Program as described on page 40.

The Textile Engineering Department conducts both applied and fundamental research. In cooperation with the Engineering Experiment Station and other segments of the University, the Department serves textiles through the utilization of its facilities. In conjunction with research undertaken by the faculty, undergraduates may have the opportunity to conduct research in areas of their special interest. Graduate students from other disciplines are welcome to conduct approved research that may be applied toward their graduate program requirements.

The Department of Textile Engineering offers three curricula to prepare for a career in one of the many facets of the industry. Textile courses in these curricula are combined with courses offered by other departments of the University to provide basic instruction in the fundamental sciences, engineering, technology and humanistic-social studies. The three curricula are:

Textile Chemistry — Students in this curriculum study the chemistry and physics of natural and man-made fibers and the theory and practice of textile dyeing and finishing. It prepares students for graduate work and careers as chemists and dyers in the textile, man-made fibers, dyestuff and other industries allied to textiles.

Textile Engineering — The curriculum in Textile Engineering offers study in basic engineering. It includes engineering science, humanistic-social studies, and the textile subjects needed for a fundamental understanding of the textile processes, materials and industry. It prepares students for graduate study and careers in textile research, engineering, production and management in the primary textile industry and allied industries, such as the manufacture of textile machinery and man-made fibers.

Textile Management and Technology — This curriculum prepares students for production, administrative, and managerial positions in a textile career. In their junior and senior years students major in production, sales, or design, according to their professional needs, by selecting courses in other disciplines through a technical elective sequence. These courses are from disciplines such as Consumer Affairs, Economics, Industrial Engineering, Management and Marketing. Entering students who are not proficient in college algebra and trigonometry are required to take 5 hours of algebra and/or 5 hours of pre-calculus with trigonometry for no credit toward graduation.

Textile Management and Technology (Dyeing and Finishing Option) — This curriculum option prepares students for production, administration, and managerial positions in a textile career oriented to the dyeing and finishing sector of the textile industry. (See Department for option information).

Curriculum in Textile Chemistry (TC)

FRESHMAN YEAR		
First Quarter		Third Quarter
CH 111 General Chemistry . . . 5	CH 112 General Chemistry . . . 5	CH 113 General Chemistry . . . 5
MH 161 An. Geom. & Cal.† . . . 5	MH 162 An. Geom. & Cal. . . . 5	MH 163 An. Geom. & Cal. . . . 5
EH 101 English Comp. 3	TE 221 Fabric Forming Syst. . . 5	TE 241 Dyeing & Finishing . . . 5
TE 101 Intr. to Text. Engr . . . 3	EH 102 English Comp. 3	EH 103 English Comp. 3
SOPHOMORE YEAR		
CH 303 Organic Chemistry . . . 5	CH 304 Organic Chemistry . . . 5	CH 305 Organic Chemistry . . . 5
MH 264 An. Geom. & Cal. . . . 5	PS 221 General Physics II . . . 3	TE 211 Yarn Forming Syst. . . 5
PS 220 General Physics 3	PS 221L Gen. Physics Lab II . . . 1	CSE 204 Computer Program . . . 3
PS 220L Gen. Physics Lab I . . . 1	HY 205 Tech. & Civiliztn. II . . . 3	HY 206 Tech. & Civiliztn. III . . . 3
HY 204 Tech. & Civiliztn. I . . . 3	MH 265 Linear Diff. Equatns . . 3	
	TE 242 Chem. Tech. of Bleach. & Dyeing & Finishing . . . 3	
JUNIOR YEAR		
TE 531 Structures & Prop. of Fibers & Polymers . . . 5	CH 205 Analyt. Chemistry 5	ACF 215 Fund. of Accounting . . 4
TE 532L Fibers Lab 2	EC 200 Economics I 5	EC 202 Economics II 5
CH 204 Analyt. Chem. 3	TE 350 Test. of Textile Mtls . . . 5	IE 410 Engr. Statistics 5
CH 204L Analyt. Chem. Lab . . . 2	EHA 304 Technical Writing 3	Technical Elective* 4
PA 212 Scientific Reasoning . . . 3		
SENIOR YEAR		
CH 507 Physical Chemistry . . . 5	CH 508 Physical Chemistry . . . 5	TE 491 Undergrad. Resrch. II . . 5
SC 211 Public Speaking 5	TE 490 Undergrad. Resrch. I . . . 5	TE 541 Appld. Dyeing Theory . . 5
TE 342 Analyt. Instrumentation in Textiles 3	TE 560 Textile Finishes 4	Technical Elective* 5
TE 470 Plant Design, Operatn. & Control. Dye & Fin . . 3	Technical Elective* 4	Free Elective 3

TOTAL — 209 QUARTER HOURS

†Students not prepared for MH 161 must take MH 160.

*Selected from an approved sequence. (See Department).

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for Free Electives (3), SC 211 (5), EHA 304 (3), and one hour of Humanistic-Social Electives.

Curriculum in Textile Engineering (TE)

FRESHMAN YEAR		
First Quarter		Third Quarter
CH 103 Fund. of Chemistry I . . . 4	CH 104 Fund. of Chemistry II . . 4	MH 163 An. Geom. & Cal. . . . 5
CH 103L Gen. Chem. Lab 1	CH 104L Gen. Chem. Lab 1	TE 211 Yarn Forming Syst. . . 5
MH 161 An. Geom. & Cal.† . . . 5	MH 162 An. Geom. & Cal. . . . 5	PS 220 Gen. Physics I 3
EH 101 English Comp 3	TE 221 Fabric Forming Syst. . . 5	PS 220L Gen. Physics Lab I . . . 1
TE 101 Intr. to Text. Engr . . . 3	EH 102 English Comp. 3	EH 103 English Comp. 3
IE 102 Graphic Communication & Design 2		
SOPHOMORE YEAR		
MH 264 An. Geom. & Cal. 5	PS 222 General Physics III . . . 3	TE 241 Dyeing & Finishing . . . 5
CH 207 Organic Chemistry . . . 4	PS 222L Gen. Physics Lab III . . . 1	ME 205 Applied Mechanics-Statics 4
PS 221 General Physics II 3	TE 212 Special Topics in Yarn Mfg. 4	CSE 204 Computer Program . . . 3
PS 221L Gen. Physics Lab II . . . 1	CH 208 Organic Chemistry . . . 3	HY 206 Tech. & Civiliztn. III . . . 3
HY 204 Tech. & Civiliztn. I . . . 3	HY 205 Tech. & Civiliztn. II . . . 3	ME 202 Structure 3
PA 212 Scientific Reasoning . . . 3	MH 265 Linear Diff. Equations . . 3	
JUNIOR YEAR		
TE 330 Mechanics of Flexible Structures . . . 5	EC 200 Economics I 5	EC 202 Economics II 5
TE 531 Structure & Prop. of Fibers & Polymers . . . 5	ME 301 Thermodynamics I or CHE 336 CHE Thermodyn. I . . . 4	EE 300 Fund. of Elect. Engr. . . 5
TE 532 Fibers Lab 2	ME 321 Dynamics I 4	CHE 361 Fluid Mechanics 4
EHA 304 Technical Writing 3	TE 222 Woven Structures 3	or
TE 321 Knit Structures 3	TE 322 Non-Conventional Fabric Structures 2	ME 340 Fluid Mechanics I 3
		TE 242 Chem. Tech. of Bleach. & Dyeing & Finishing . . . 3

* ROTC

SENIOR YEAR

IE 410	Engr. Statistics	5	IE 360	Engr. Econ. Analysis	3	TE 491	Undergrad. Resrch. II	5
TE 350	Test. of Textile Mtls.	5	*SC 211	Public Speaking	5	EGR 491	Legal Aspects Engr.	3
TE 342	Analyt. Instrumentation	3	TE 490	Undergrad. Resrch. I	5		Engr. Elective*	4
	in Textiles	3		Engr. Elective*	5		Hum.-Soc. Elective	3
TE 311	Textured Yarns	2						
	Engr. Elective*	3						

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TOTAL — 210 QUARTER HOURS

†Students not prepared for MH 161 must take MH 160.

Six hours of Basic ROTC may be substituted for PA 212 (three hours) and three hours of Humanistic-Social Electives; six hours of Advanced ROTC for EGR 491 (3) and EHA 304 (3).

*Selected from an approved sequence. (See Department).

Curriculum in Textile Management and Technology (TMT)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 161	An. Geom. & Cal.*	5	CH 103	Fund. of Chemistry I	4	CH 104	Fund. Chemistry II	4
TE 141	Textile Chemistry	5	CH 103L	Gen. Chemistry Lab	1	CH 104L	Gen. Chemistry Lab	1
EH 101	English Comp.	3	TE 211	Yarn Forming Syst.	5	TE 241	Dyeing & Finishing	5
TE 101	Intr. to Text. Engr.	3	TE 221	Fabric Forming Syst.	5	EH 103	English Comp.	3
			EH 102	English Comp.	3	IE 102	Graphic Communication & Design	3
							Hum.-Soc. Elective	3

SOPHOMORE YEAR

EC 200	Economics I	5	TE 232	Textile Fibers II	5	EC 202	Economics II	5
TE 231	Textile Fibers I	5	TE 212	Special Topics in Yarn Mfg.	4	PS 205	Intr. Physics I	3
HY 204	Tech. & Civiliztn. I	3	HY 205	Tech. & Civiliztn. II	3	PS 205L	Intr. Physics Lab I	1
CSE 204	Computer Program	3	PA 212	Scientific Reasoning	3	HY 206	Tech. & Civiliztn. III	3
			TE 222	Woven Structures	3	TE 242	Chem. Tech. of Bleach, Dyeing & Finishing	3
						TE 213	Prep. of Yarns for Fabric Forming	2

JUNIOR YEAR

SC 211	Public Speaking	5	IE 220	Applied Statistics	5	TE 351	Analysis of Textile Fabric Structures	5
TE 321	Knit Structures	3	TE 350	Test. of Textile Mtls.	5	ACF 215	Fund. of Accounting	4
TE 342	Analyt. Instrumentation in Textiles	3	TE 325	Design of Textile Fab.	4	TE 352	Textile Qual. Control	3
TE 311	Texturized Yarns	2	EHA 304	Technical Writing	3		Technical Electives**	6
TE 322	Non Conventional Fabric Structures	2						
TE 323	Carpet Structures	2						

SENIOR YEAR

TE 490	Undergrad. Resch. I	5	TE 491	Undergrad. Resch. II	5	TE 481	Plant Design, Operation & Control II	3
TE 380	Textile Costing	3	TE 480	Plant Design, Operation & Control I	3		Technical Electives**	9
	Technical Electives**	7		Technical Electives**	7		Free Electives	3
	Free Electives	3		Free Electives	3		Basic Science Elect.**	3

TOTAL — 209 QUARTER HOURS

*Students not prepared for MH 161 must take MH 160.

**Selected from an approved sequence. (See Department).

Six hours of ROTC may be substituted for six hours of Free Electives; six hours of Advanced ROTC, for three hours of Free Electives and three of Humanistic-Social Electives.

Auburn University Aviation

Gary W. Kiteley, *Director*

James T. Hendrick, *Airport Manager*

Auburn University Aviation was established in 1942 as a department of the School of Engineering to offer flight education for students of the University, for the Armed Forces, and for the general public; and to serve the citizens of Alabama and the Southern region by providing other services in aviation. The department cooperates fully with the Federal Aviation Administration and other organizations in conducting special aviation research and education programs.

AU Aviation serves as a laboratory of practical instruction for students enrolled in the curricula of Aviation Management and Aerospace Engineering and other University curricula. Flight courses offered lead to FAA private, commercial, multi-engine, instrument, flight instructor, and airline transport certificates and ratings.

The University owns and operates the 334-acre Auburn-Opelika R. G. Pitts Airport, conveniently located within three miles of the campus, with two lighted, 4000-foot, paved runways; a two-story administration building; two large hangars, two five-unit T-hangars, and one five-unit Planeport. The department currently operates eight single and multi-engine aircraft, plus one flight simulator.

In addition to flight education, other services such as fuel, maintenance and airplane storage are provided at the airport. AU Aviation also provides air transportation for University faculty and staff on official University business.

The department is fully certified by the FAA as an Air Agency with examining authority for private, commercial, and instrument courses, and multi-engine courses. The department through FAA authorization is able to conduct FAA flight and written examinations.



School of Forestry

EMMETT F. THOMPSON, *Acting Dean*

THE SCHOOL OF FORESTRY offers curricula leading to bachelor of science degrees in forest management, forest products and forest engineering. The School also offers an Honors program which leads to the degree of Bachelor of Science in Forestry (Honors Program).

The forest management degree is appropriate for students who seek employment with the forest products industry in either land management or raw material supply, as well as prepares students for careers with various public agencies and consulting firms. Students interested in careers in forest products processing or technical sales are enrolled in forest products. The forest engineering curriculum, which is administered in conjunction with the Department of Agricultural Engineering, combines professional courses in engineering and forestry for students who want careers in the forest industries that require training in both engineering and forestry.

The School of Forestry is accredited by the Society of American Foresters to offer professional Forestry education in the approved curricula of Forest Management and Forest Engineering. The Forest Engineering curriculum is designed to also meet accreditation requirements of the Accreditation Board for Engineering and Technology.

Within the University's overall purpose and direction, the School of Forestry's goals are to develop excellence in forestry education and research in a manner compatible with the needs of forestry and forest products firms in the southeastern United States. With respect to undergraduate education, excellence means graduating individuals who have the necessary skills for initial employment as well as the breadth and depth of educational background to support career advancement. The School's orientation in achieving excellence is toward the forest products industry and the raw material base which supports the industry, while fully recognizing that proper concern for raw material supply includes responsible stewardship of the total forest resource.

Admission

Freshmen eligibility is determined by the Admissions Office. However, since the requirements for forestry education necessitate high school preparatory work of high intellectual quality and of considerable breadth, the following program is recommended as *minimum* preparation: English, four units; mathematics (including algebra, geometry, trigonometry, and analytical geometry), four units; chemistry, one unit; biology, one unit; history, literature, social science, two or three units. Physics and foreign language are recommended but not required.

Transfers from other institutions must apply through the Admissions Office. (See regulations, page 16). The exact placement of transfer students can be determined only upon review of their transcripts by the School of Forestry. Transfer credit will not normally be allowed for any course with a grade lower than C at another college or university.

Credit toward a degree in any curriculum in the School of Forestry will not be allowed for mathematics, chemistry, or physics courses at a level lower than those specified in the curriculum for the degree sought. However, students who are not prepared to take the course prescribed may take lower level courses without degree credit.

Transfer credit for forestry subjects not considered equivalent to those required in the chosen curriculum may be substituted for elective credit; however, duplication of credit will not be allowed. Equivalency of forestry subjects will be determined by the Dean's Office; however, students may also obtain transfer credit on the basis of validating examinations. Arrangements for validating examinations must be made with the Dean of Forestry in the first quarter of the student's enrollment in the School of Forestry and the examinations must be completed before the middle of the second quarter. Transfer credit for courses considered upper division courses at Auburn University will not be accepted from two-year colleges.

Forest Engineering

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter					
MH	161	An. Geom. & Cal.*	5	MH	162	An. Geom. & Cal.	5	MH	163	An. Geom. & Cal.	5
BI	101	Prin. of Biology	5	BI	102	Plant Biology	5	PS	220	Gen. Physics	4
IE	102	Graph. Comm. & Design	2	EH	102	English Comp.	3	CSE	204	Comptr.Prgmng.	3
EH	101	English Comp.	3			Hum.-Soc. Elective	3	EH	103	English Comp.	3
		History or Lit.***	3			History or Lit.***	3			History or Lit.***	3

SOPHOMORE YEAR

MH	264	An. Geom. & Cal.	5	ME	301	Thermodynamics I	4	ME	321	Dynamics I	4
PS	221	Gen. Physics II	4	PS	222	Gen. Physics III	4	ME	207	Strength of Mat. I	3
ME	205	Appl. Mech. Stat.	4	MH	265	Diff. Equat.	3	EC		Economics†	5
CH	103	Fund. of Chem. & Lab.	5	CH	104	Fund. Chem. & Lab.	5	ACF	211	Accounting	4
										Hum.-Soc. Elective	3

SUMMER CAMP**

FY	300	Intr. to Forestry	2
FY	301	Dendrology I	3
FY	302	Forest Biology	2
FYE	304	Forest Surveying	5
FY	305	Field Mensuration	4

JUNIOR YEAR

ME	316	Strength of Mat. II	4	FY	314	Sampling II	4	FY	421	Forest Ecology	5
FY	313	Sampling I	4	AN	311	Ag. Mach. & Pwr.	5	FY	415	Mensuration	5
ME	340	Fluid Mech.	3			Unit	5	FYE	401	Forest Mach.	3
EC		Economics†	5	AY	305	Gen. Soils	5	EE	302	Intr. Elec. Engr. I	3
						Engr. Elective	5				

SENIOR YEAR

FY	540	Forest Econ.	4	FY	541	For. Mgt. & Admin.	4	FYE	571	Adv. Harv.	3
FY	520	Silviculture	5	FYE	570	Harvesting	3			Engr. Elective	6
		Engr. Elective	2			Hum.-Soc. Elective	4	FYE	517	Photogrammetry	5
FYE	402	Forest Road Design	3	FYE	430	Ag. & For Engr. Des. I	3	FY	542	Forest Policy	3
FYE	403	Ag. & Forest Struc. Design	3	EE	303	Intr. Elec. Engr. II	3				

TOTAL — 225 QUARTER HOURS

*Students whose combined ACT scores for English and Mathematics are lower than 50, or whose total SAT scores are less than 1100, are enrolled in MH 160 for no credit.

**Summer Camp may be taken at the end of either the Freshman or Sophomore years. It may be taken between the Freshman and Sophomore years by a transient student who is regularly enrolled at another institution and is planning to transfer to Auburn University. Students must be in residence at the camp. Co-op students should take Summer Camp at the end of their Freshman year. IE 102 is a prerequisite for Summer Camp.

***Selected from one of the following sequences: HY 101-102-103; HY 204-205-206; EH 260-261-262.

†Selected from one of the following sequences: EC 200-202 or AEC 202-206.

Forest Management (FY)

FRESHMAN YEAR

First Quarter				Second Quarter				Third Quarter			
BI	101	Prin. of Biology	5	BI	102	Plant Biology	5	SC	211	Public Speaking	5
MH	161	An. Geom. & Cal.*	5	MH	162	An. Geom. & Cal.	5	MH	163	An. Geom. & Cal.	5
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3
		History or Lit.†	3			History or Lit.†	3			History or Lit.†	3
								FYE	306	Forest Cartography	1

SUMMER CAMP**

FY	300	Intr. to Forestry	1
FY	301	Dendrology I	3
FY	302	Forest Biology	2
FYE	304	Forestry Surveying	5
FY	305	Field Mensuration	4

SOPHOMORE YEAR					
CH 103	Fund. of Chem. & Lab. ....5	CH 104	Fund. of Chem. & Lab. ....5	PS 200	Found. of Physics ....5
	Economics** ....5		Economics ....5	ACF 211	Prin. of Account. ....4
MT 241	Business Law† ....4	CSE 204	Comp. Prog. ....3	GL 110	Phys. Geology ....5
	Elective ....2		Elective ....3		Elective ....2
JUNIOR YEAR					
FY 313	Sampling I ....4	FY 314	Sampling II ....4	FY 421	Forest Ecology ....5
FY 320	Forest Tree Physiol. ....3	FY 415	Forest Mensuration ....5	FY 422	Forest Geography ....2
EHA 304	Tech. Writing ....3	AY 305	Gen. Soils ....5	FY 462	Forest Rec. ....3
	Elective†† ....5	FP 439	Wood ID & Prod. ....3		Plan-Mgt. ....3
FY 424	Dendrology II ....1			FYE 517	Photogram. ....5
SENIOR YEAR					
FY 540	Forest Econ. ....4	FY 541	Forest Mgt. & Admin. ....4	FY 481	Forest Prob. II ....4
FY 520	Silviculture ....5			FY 542	Forest Policy ....3
ZY 305	Forest Entomology ....3	FY 445	Forest Fire Con. & Use ....3	BY 310	Forest Pathology ....3
	Elective ....5	FYE 570	Harvesting ....3		Elective ....5
		FY 480	Forest Prob. I ....0		
		ZY 425	Forest Wildlife Mgt. ....3		
			Elective ....5		

TOTAL — 210 QUARTER HOURS

*Students whose combined ACT scores for English and mathematics are lower than 50, or whose total SAT scores are less than 1100, are enrolled in MH 160 for no credit.

**Summer camp may be taken at the end of either the Freshman or Sophomore years. It may be taken between the Freshman and Sophomore years by a transient student who is regularly enrolled at another institution and is planning to transfer to Auburn University. Co-op students should take Summer Camp at the end of the Freshman Year. Students must be in residence at the camp. Either FY 306 or an approved drawing course is prerequisite for Summer Camp. However, a drawing course will not substitute for FY 306.

***Selected from one of the following sequences: EC 200-202 or AEC 202-206.

†Selected from one of the following sequences: HY 101-102-103; HY 204-205-206; or EH 260-261-262.

†AEC 307, Agricultural Law may be substituted for MT 241, Business Law.

††At least one elective course must be chosen from the humanities.

Honors Program in Forestry

The Honors Program in Forestry provides able students opportunity to explore in depth areas in which they are interested and to prepare for graduate school. The program is flexible, permitting concentration of effort in areas of the student's choosing.

Students with at least five quarters remaining in the Forest Management curriculum and with a grade point average of 2.90 or better may apply for admission to the program.

JUNIOR YEAR														
First Quarter					Second Quarter					Third Quarter				
FY	313	Sampling I	4		FY	314	Sampling II	4		FY	421	Forest Ecology	5	
FY	320	Forest Tree Physiol.	3		FY	415	Forest Mensuration	5		BY	501	Biolog. Stat.	5	
		Electives*	9		AY	305	Gen. Soils	5				Elective	5	
							Elective	3						
SENIOR YEAR														
FY	540	Forest Econ.	4		FY	541	Forest Mgt. & Admin.	4		FY	481	Forest Prob. II	4	
FY	520	Silviculture	5		FY	480	Forest Prob. I	0				Electives	14	
		Electives	8		FY	499	Honors Project	2-5						
							Electives	6-9						

TOTAL — 210 QUARTER HOURS

*At least one elective course must be chosen from the humanities.

Twenty-five of the free elective hours are to be chosen under the supervision of the faculty adviser, so as to develop a distinct program leading to a pre-determined goal.

Forest Products (FP)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
EH	101	English Comp. ....3	EH	102	English Comp. ....3	EH	103	English Comp. ....3
HY	101	World History ....3	HY	102	World History ....3	HY	103	World History ....3
MH	161	An. Geom. & Cal. ....5	MH	162	An. Geom. & Cal. ....5	MH	163	An. Geom. & Cal. ....5
BI	101	Prin. of Biology ....5	BI	102	Plant Biology ....5	CH	103	Fund. of Chem. I
		Electives ....2			Electives ....2			& Lab. ....5
								Electives ....2

SOPHOMORE YEAR

CH	104	Fund. of Chem. II	CH	203	Organic Chemistry ...5	PS	206	Intr. to Physics
		& Lab. ....5	PS	205	Intr. to Physics			& Lab. ....4
BST	215	Intr. Bio. Sta. ....5			& Lab. ....4	ACF	211	Prin. of Acct. I ....4
EC	200	Economics I* ....5	EC	202	Economics II* ....5	FP	311	Structure of Wood ....5
SC	202	Appl. Speech Com. ....3	CSE	204	Computer Prog. ....3			Restricted Elective** .5
		Elective ....1			Electives ....2			

JUNIOR YEAR

ACF	212	Prin. of Acct. II ....4	FP	330	Solid Wood	ACF	213	Managerial Cost &
FP	206	Wood Measurement ...3			Products ....3			Budgeting ....4
EHA	304	Tech. Writing ....3	FP	478	Intr. to Wood Chem. ...3	ACF	361	Prin. of Business
BSC	211	Mech. Structure ....5	FP	474	Wood Gluing &			Finance ....5
		Elective ....5			Coating ....3	FP	475	Wood-Based Panel
					Elective ....9			Technology ....3
						MN	310	Prin. of Mgt. ....3
								Elective ....3

SENIOR YEAR

FP	525	Phys. Prop. of Wood ...3	FP	531	Mech. Prop. of Wood .4	FP	535	For. Products Prod.
FP	532	Deterioration & Wood	FP	533	Wood Drying Proc. ...3			Mgt. and Control ....3
		Treating Processes ...3	FP	536	Forest Prod. Mktg. ...3	MN	500	Labor Relations ....5
MN	442	Personnel Mgt. ....4	FY	590	Seminar ....1			Restricted Electives ..7
		Restricted Electives ...5			Restricted Electives ...5			

TOTAL — 210 QUARTER HOURS

*AEC 202 and AEC 206 sequence may be taken instead of EC 200 and EC 202.

**Restricted Electives: AN 401, 402, 403, 430; CH 105-105L, 204-204L, 205, 207-207L, 208-208L, 209, 316; Any FY or FYE course; IE 102, 300, 302, 342, 352, 410; ME 205, 207, 309, 316; MH 264, 265, 266; MN 346, 420; MT 331, 333; MT 202, 304; PS 207, 207L.

School of Home Economics

RUTH L. GALBRAITH, *Dean*

DOROTHY H. CAVENDER, *Assistant Dean*

HOME ECONOMICS is a professional program with its roots in the arts, sciences, and humanities. It is a complex of studies serving many purposes — broad liberal education, preparation for careers, and a background for home and family living. Areas of specialization are concerned with many aspects of environment, health, and human development. With emphasis on both breadth of knowledge and its application to the solution of human problems, Home Economics offers professional or pre-professional preparation for an increasing variety of positions with opportunities available in education, business, industry, and government.

Programs of study leading to the Bachelor of Science degree can be planned within eleven curricula in the School of Home Economics. These curricula are designed with flexibility to meet the needs of students with varying interests. The School includes the Departments of Consumer Affairs, Family and Child Development, and Nutrition and Foods.

Students within any curricula may elect to complement their major area of study with a multi-disciplinary Certificate in Aging Studies, composed of 25 hours (see page 191). Students should contact the Academic Adviser for further information.

Department of Consumer Affairs

The Department of Consumer Affairs focuses on the near physical environment and resources, including personal interaction with this environment. Six majors are offered in this department: Clothing, Textiles, and Related Art; Fashion Merchandising; Housing; Interior Furnishings and Equipment; Family Resource Management; and Consumer and Family Economics. These curricula lead to careers in business and government which apply science and technology to study consumer needs, to evaluate consumer products, and to inform consumers of the findings.

Clothing, Textiles, and Related Art (CTC, CTD, CTT)

Clothing, Textiles, and Related Art is a professional three-option curriculum providing preparation in areas of specialization related to students' professional goals. Diversification within the major allows application of knowledge in such varied fields as textile and apparel design, production and promotion; textile science; fashion journalism; and consumer-producer relations. A unique interdisciplinary potential involving Clothing and Textiles, Textile Engineering, the School of Business, the Agricultural Experiment Station (for research) and the Cooperative Extension Service exists on one campus located in a textile area.

Curriculum in Clothing, Textiles, and Related Art (CT)

Options: Clothing (CTC), Textile Design (CTD), Textile Science (CTT)

Curriculum Core — 96 hours

EH 101, 102, 103 English Comp.	9	CH 104 Fund. of Chemistry II	4
MH 140 College Algebra		CH 104L Gen. Chem. Lab	1
or		CH 203 Organic Chemistry**	5
MH 160 Pre-Calculus with Trig.**	5	CA 113 Housing for Man	3
EH 253, 254, 261, or 262 Literature	6	CA 115 Clothing and Man	3
SC 202 Applied Speech Comm.	3	CA 116 Art for Living I	3
JM 315 Tech, Journalism	3	CA 116L Art for Living Lab	2
HY/ AT*	9	CA 225 Textiles	5
PG 211 Psychology	5	CA 323 Man the Consumer	3
SY 201 Intr. to Sociology	5	CA 398 Professional Planning & Development	1
EC 200 Economics I	5	CA 431 Man-Environ. Rel.	2
CH 103 Fund. of Chemistry	4	NF 112 Nutrition and Man	3
CH 103L Gen. Chem. Lab	1	FCD 157 Fam. and Human Dev.	3
		Liberal Ed. Elective	3

*Students may take any combination of World History, HY 101-102-103; Tech. and Civilization, HY 204-205-206; History of Art, AT 171-172-173.

**Textile Science majors omit CH 203 and take MH 160, CH 207, 207L.

Clothing Option (CTC) — Required Courses — 64-74 hours

CA 105 Fund. of Clothing	5	CA 395 Clothing Design	5
CA 204 Commercial Apparel Production**	3	CA 505 Costume Draping	5
CA 205 Cloth. Cons. and Sel.	3	CA 525 History of Costume	5
CA 206 Garment Structure	3	CA 555 Flat Pattern Design	5
CA 226 Fashion Sketching	3	CA 556 Comp. Meth. App. Prod.	5
CA 316 Fashion Analysis	5	CA 580A Problems in Design**	5
CA 336 Field Experience	5-15	Liberal Education Elective	4
CA 385 Creative Weaving	3		

**Students are required to take CA 204 and CA 580A or participate in the transfer program with Southern Technical Institute, Marietta, Ga., for a minimum of one quarter.

Approved professional electives — 20-30 credit hours to be selected.

10 hours to be selected from among:

CA 209, 216, 325, 334, 336, 343, 350, 399, 490, 490A, 511, 511L, 515, 516, 521, 524, 530, 535, 538, 553, 575, 576, 580A, 583, 587, 588.

10 hours to be selected from among:

EC 202; MN 274, 375; PG 330, 431; SY 204, 310, 411; JM 221, 322, 421; AT 112, 121; TE 221, 222, 325, 421; ACF 211; MT 331, 332; MN 207, 310, 415; ANT 206; EHA 415. Courses or a sequence in any other department may be used to build strength for a selected profession on prior approval of the adviser.

Free Electives (15 hours) to be selected.

Textile Design Option (CTD) — Required Courses — 50-52 hours

CA 216 Art for Living II	3-5	CA 576B Adv. Print., Dye.: Block Print	3
CA 313 Home Furnishings	5	CA 576C Adv. Print., Dye.: Screen Print	3
CA 385 Creative Weaving*	3	CA 586 Rug Weaving	5
CA 515 History of Textiles	5	CA 587 Adv. Pat. Weaving	5
CA 575 Creative Textile Design*	5	CA 588 Experimental Weaving	5
CA 576A Adv. Print., Dye.: Discharge		AT 112 or 121 Fundamentals*	5
and Resist. Print.	3		

*These courses must be completed by the end of the junior year.

Approved Professional Electives — 43-45 hours to be selected from among:

AT 111, 112, 113, 121, 122, 123; *CA 205, *226, 303, 343, 345, 395, *490, *525, *535, *580; *TE 221, *222, *421.

*These courses strongly suggested.

Free Electives (14 hours) to be selected.

Textile Science Option (CTT) — Required Courses — 48 hours

BI 105 Perspectives in Biology	5	CA 385 Creative Weaving	3
BY 108 Microbes and Man	5	CA 515 History of Textiles	5
BY 501 Biological Statistics	5	CA 535 Textile Testing	5
CH 208 Organic Chemistry	3	CA 560 Textile Finishes	4
CH 208L Organic Chemistry Lab	2	CA 560L Textile Finishes Lab	1
PS 200 or 205 Physics	5	CA 583 Soiling & Def. of Textiles	5

Approved Professional Electives — 45 hours to be selected from among:

CA 313, 342, 490, 575; CH 105, 105L, 204, 204L, 209, 316, 515, 516; MH 161, 162, 183; PS 206; TE 232, 241, 242, 531, 532, 541 and approved business courses not to exceed 15 quarter hours.

Free Electives (16 hours) to be selected.

TOTAL — 205 QUARTER HOURS

Students with other specialized professional goals in Clothing, Textiles, and Related Art should plan an appropriate coordinated program of electives to provide needed knowledge and competence.

Students interested in combining Clothing and Textiles with teacher certification, consult adviser for specific course requirements.

All electives must be approved by the student's adviser.

Consumer and Family Economics (CFE)

The curriculum in Consumer and Family Economics prepares students for professional positions that deal primarily with the economic problems of individuals and families. These include positions in the following areas: credit counseling in banks, housing authorities, social service agencies, and independent credit counseling services; consumer protection with local, state, and federal agencies; and business and industry.

Curriculum in Consumer and Family Economics (CFE)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH	140	College Algebra or	BI	105	Persp. in Biol. ....5	BI	107	Environ. Biol. ....5
MH	160	Pre-Cal w/Trig ....5	CA	113	Housing for Man ....3	PG	211	Psychology ....5
CA	116	Art for Living I ....3	EH	102	English Comp. ....3	CA	115	Clothing & Man ....3
EH	101	English Comp. ....3	NF	112	Nutrition and Man ....3	EH	103	English Comp. ....3
FCD	157	Fam. & Human Dev. ....3			Liberal Ed. Elective ....3			

SOPHOMORE YEAR

EC	200	Economics I* ....5	EC	202	Economics II* ....5	FCD	270	Family II ....4
HY	204	Tech. & Civ. I ....3	SY	201	Intr. to Soc. ....5	HY	206	Tech. & Civ. III ....3
SC	211	Public Speaking ....5	HY	205	Tech. & Civ. II ....3			Prof. Elective ....5
		Hum/Fine Arts** ....5			Prof. Elective ....5			Math/Nat. Sci.** ....5

JUNIOR YEAR

CA	233	Home Equip. I ....5	MN	310	Prin. of Mgt. ....4	EC	360	Money & Banking or
MT	255	Leg. Soc. Env. Bus. ....4	MT	331	Prin. of Mkt. ....5	EC	443	Law & Economics ....5
CA	323	Man the Consumer ....3	CA	398	Professional Planning	CA	553	Cons. & the Market ....3
EHA	315	Bus. Prof. Writ. ....3			and Development ....1	CA	570	Alloc. Fam. Resources 3
		Elective ....3			Prof. Elective ....5	CA	431	Man-Environ. Rel. ....2
					Elective ....3	MT	341	Cons. Behavior ....5

SENIOR YEAR

CA	514	Soc. Prob. of Housing 5	CA	541	Fam. Finan. Mgt. ....5	CA	528	Cons. Economics ....5
CA	530	Cons/Fam. Econ.			Prof. Electives ....9	CA	336	Field Exp. in CA ....10
		Issues ....3			Elective ....3			Prof. Electives ....3
		Elective ....3						
		Prof. Elective ....5						

TOTAL — 205 QUARTER HOURS

*A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed from the School of Business.

**Liberal Education Electives.

APPROVED PROFESSIONAL ELECTIVES

Select 32 hours from the following: CA 205, 303, 343, 443, 513, 533, 538; FCD 306, 310, 477, 568; NF 104, 204, 358; ACF 211, 212, 314, 320; EC 206, 340, 350, 360*, 433*, 551, 552, 554, 555, 556, 557; EHA 415, 416; JM 315; MN 274; MT 241, 242, 436; RSY 362, 541, 561, 562; SC 204; SY 220, 370, 501; SW 375, 376, 512, 575.

*Selection of this course to fulfill EC, MN, MT requirements precludes selection to fulfill Professional Electives requirements.

Family Resource Management (FRM)

The Family Resource Management major is designed for students interested in a broad general education in home economics. Professional preparation is offered for positions in Cooperative Extension Service, home service, and other areas of business requiring a background in home management and social science.

Curriculum in Family Resource Management (FRM)

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
MH	160	Pre Cal. w/Trig. ....5	BI	105	Persp. in Biol. ....5	BI	107	Environ. Biol. ....5
CA	116	Art for Liv. I ....3	NF	104	Prin. Food Prep. ....5	CA	105	Fund. Cloth. ....5
EH	101	English Comp. ....3	CA	115	Cloth. & Man. ....3	EH	103	English Comp. ....3
NF	112	Nutr. & Man. ....3	EH	102	English Comp. ....3	FCD	157	Fam. & Hum. Dev. ....3
			SOPHOMORE YEAR					
EC	200	Econ. I* ....5	EC	202	Econ. II* ....5	PS	200	Fnd. of Physics ....5
SY	201	Intr. to Soc. ....5	NF	204	Meal Mgt. ....5	FCD	330	Lifespan Hum. Dev. ....5
CA	113	Housing for Man. ....3	FCD	270	Family II ....4	PG	211	Psychology ....5
HY	204	Tech. & Civ. I ....3	HY	205	Tech. & Civ. II ....3	HY	206	Tech. & Civ. III ....3
EHA	315	Bus. Prof. Writing ....3						
			JUNIOR YEAR					
CA	233	Home Equip. I ....5	MT	331	Prin. of Mkt. ....5	MN	310	Prin. of Mgt. ....4
SC	211	Public Speaking ....5	CA	205	Cloth. Constr. & Sel. ....3			Prof. Elective** ....12
CA	323	Man the Consumer ....3	CA	398	Professional Planning and Development ....1			Liberal Ed. Elective ....3
		Elective ....3			Liberal Ed. Elective ....5			
					Elective ....3			
			SENIOR YEAR					
CA	530	Cons./Fam. Econ. Issues ....3	CA	570	Alloc. Fam. Resources ....3	CA	553	Cons. & the Market ....3
		Lib. Ed. Elective ....5	CA	541	Fam. Finance Mgt. ....5	CA	528	Cons. Economics ....5
		Prof. Elective** ....4	CA	443	Fam. Resource Mgt. Resid. ....5	CA	533	Home Equipment II ....5
		Elective ....5	CA	431	Man-Environ. Rel. ....2			Prof. Elective** ....3
					Lib. Ed. Elective ....5			

TOTAL — 205 QUARTER HOURS

*A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed from the School of Business.

**The Ala. Coop. Ext. requires Extension Home Economists to have a minimum of 70 hours of home economics courses above the 100 level.

APPROVED PROFESSIONAL ELECTIVES

Choose 20 hours from the following: CA 303, 333, 336, 343, 355, 490, 511, 513, 514, 538, 553; FCD 306, 310, 477, 568; NF 324, 358, 362; AR 507, 530; CED 524; EC 206, 340, 360, 433; EHA 415, 416; JM 101, 221, 313, 315, 321, 322; MT 241, 242, 255, 341; PO 209, 210, 323, 324, 325; RSY 362, 541, 561, 562, 565; SC 204, 273, 326, 501, SW 375, 376, 512, 575; VED 556.

Fashion Merchandising (FM)

Fashion Merchandising prepares majors for such positions as buyer or assistant buyer, comparison shopper, fashion stylist or coordinator, merchandise manager, fashion promoter, or a store owner-manager. Ten weeks of retail training is included in the fashion merchandising curriculum.

Curriculum in Fashion Merchandising (FM)

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
MH	140	College Algebra ....5	CH	103	Fund. of Chem. I ....4	CH	104	Fund. of Chem. II ....4
CA	116	Art for Liv. I ....3	CH	103L	Gen. Chem. Lab. ....1	CH	104L	Gen. Chem. Lab. ....1
CA	116L	Art for Liv. Lab. ....2	CA	115	Clothing & Man. ....3	EH	103	English Comp. ....3
EH	101	English Comp. ....3	EH	102	English Comp. ....3	FCD	157	Fam. & Human Dev. ....3
		HY/AT* ....3			HY/AT* ....3			HY/AT* ....3
					Liberal Ed. Elective ....3	NF	112	Nutrition & Man. ....3

SOPHOMORE YEAR

CH 203	Org. Chem. ....5	CA 105	Fund. of Clothing ....5	CA 225	Textiles ....5
EC 200	Economics I ....5	EC 202	Economics II ....5	ACF 211	Prin. of Acc. I ....4
PG 211	Psychology ....5	SY 201	Intr. to Soc. ....5	SC 202	App. Sp. Comm. ....3
CA 113	Housing for Man ....3	CA 205	Cloth. Cons. & Sel. ....3		Electives ....5

*Students may take any combination of World History, HY 101-102-103; Tech. and Civilization, HY 204-205-206; History of World Art, AT 171-172-173.

JUNIOR YEAR

CA 226	Fash. Sketch ....3	CA 316	Fash. Analysis ....5	CA 323	Man the Consumer ....3
JM 315	Tech. Journ. ....3	MT 333	Merch. Mgt. **5	CA 325	Fashion Merch. ....5
MT 331	Prin. of Mkt. **5	CA 334	Intr. to Fld. Exp. ....2		Prof. Electives* ....3
EH ***	Prof. Electives* ....3	CA 398	Professional Planning and Development ....1		Electives ....6
	Prof. Electives* ....5		Prof. Electives* ....5		

SENIOR YEAR

CA 335	Retail Training ....13	CA 516	Apparel Qual. Eval. ....5	CA 525	History of Cost ....5
		CA 521	World App. Trade, Prod. Dist. ....4	CA 431	Man-Env. Rel. ....2
		CA 535	Textile Testing ....5		Prof. Electives* ....10
			Prof. Electives* ....4		

TOTAL — 205 QUARTER HOURS

*Professional Electives — at least 8 hours selected from among CA 206, 385, 395, 511, 523, 524, 538, 556, 575, 583. At least 13 hours from ACF 212; EC 206; MN 274, 310, 346, 442; MT 241, 242, 332, 436, 437, 440; SY 505; CA 350; MN 207; or any justifiable course.

**A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340; is allowed for credit from the School of Business.

***Students may choose one literature course for a minimum of three hours credit.

Special Focus in International Retailing

Students desiring a Special Focus in International Retailing should select the following courses as Professional Electives: MT 341, MT 440, CA 521, and CA 538. CA 335 (internship) should be done in Europe, Asia or Latin America. Some foreign language courses may also be used for professional electives by students wanting the focus in International Retailing.

One-year Transfer Programs

Qualified students in the Clothing, Textile Design, or Fashion Merchandising curricula may apply for one of several one-year transfer programs to be taken during the junior year. Transfer Programs are planned with an adviser so that transfer credits meet Auburn curriculum requirements while the student earns an Associate Degree from the transfer institution.

Programs are available with the Fashion Institute of Technology in New York in clothing and textile design and merchandising. Apparel Engineering is available in cooperation with Southern Technical Institute in Marietta, Ga.

For further information, contact the Head of the Consumer Affairs Department.

One-quarter Internship Programs

Students majoring in Consumer & Family Economics, Fashion Merchandising, Interior Furnishings and Equipment, or the Clothing Option of the CT curriculum are required to arrange an internship or field experience away from campus during one quarter of the junior or senior year. Such experiences can also be arranged for students in any Consumer Affairs major. To earn credit, internship site and work-study program must be approved by the student's adviser.

Housing (HS)

Graduates of the program will fill the growing need for professionals such as housing community service director, housing educator, consultant, counselor, public housing manager, or extension worker.

Curriculum in Housing (HS)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI 105	Persp. in Biol. ....5	BI 107	Environ. Biol. ....5	SY 201	Intr. to Soc. or ....5			
MH 160	Pre-Cal. w/Trig. ....5	PG 211	Psychology ....5	RSY 261	Rural Soc. ....5			
CA 113	Housing for Man ....3	CA 115	Clothing & Man ....3	CA 116	Art for Living I ....3			
EH 101	English Comp. ....3	EH 102	English Comp. ....3	CA 116L	Art for Living Lab ....2			
		NF 112	Nutrition & Man ....3	EH 103	English Comp. ....3			
				FCD 157	Fam. & Human Dev. ....3			

SOPHOMORE YEAR

CA 233	Home Equipment I	5	BSC 202	Materials of Const.	5	EC 200	Economics I**	5
MT 241	Business Law I**	4	CA 303	The House	5	RSY 362	Comm. Org.	5
CA 323	Man the Consumer	3	SY 220	Statistics	5	EH 315	B & P Rept. Writing	3
HY 204	Tech. & Civ. I	3	HY 205	Tech. & Civ. II	3	HY 206	Tech. & Civ. III	3
	Liberal Ed. Elective	3				SC 202	App. Speech Comm.	3

JUNIOR YEAR

CA 514	Soc. Prob. of Hous.	5	MT 331	Prin. of Mkt.**	5	PO 323	Mun. Govt.	5
EC 202	Economics II**	5	CA 398	Professional Planning and Development	1	CA 513	Housing for Special Needs	4
	Hum/Fine Arts*	5		Math/Nat. Sci.	5	CA 553	Cons. & the Mkt.	3
CA 431	Man-Environ. Rel.	2		Prof. Elective	5		Elective	5
				Elective	3			

SENIOR YEAR

CA 530	Cons./Fam. Econ. Issues	3	AEC 509	Resource Econ.	5	CA 336	or Prof. Electives***	15
SY 505	Urban Sociology	5	CA 541	Fam. Fin. Mgt. Electives	4			
	Prof. Elective	9						

TOTAL — 205 QUARTER HOURS

*Liberal Education Electives.

**A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed from the School of Business.

***If CA 336 is chosen, adviser will reduce the number of professional electives needed in each area.

APPROVED PROFESSIONAL ELECTIVES

An internship (CA 336) may be used in partial fulfillment of professional electives.

Minimum of 10 hours selected from: FCD 267, 269, 306, 310; NF 358; SW 375; SY 202, 204, 310, 370, 409, 501, 520.

Minimum of 10 hours selected from: ACF 211, 323; EC 206, 360, 559; MN 310; MT 242; RP 474, 524, 525, 527, 530, 545, 575.

Minimum of 10 hours selected from: BSC 101, 261-262; AR 360, 370, 474; CA 313, 333, 343, 355, 533; HF 221; IE 308; U 210.

Interior Furnishings and Equipment (IFE)

Professional career opportunities for graduates in Interior Furnishings and Equipment include designing, merchandising, and consulting positions with retailers, manufacturers, public utilities, and cooperative extension.

Curriculum in Interior Furnishings and Equipment (IFE)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 140	College Algebra	5	CH 103	Fund. of Chemistry I	4	CH 104	Fund. of Chemistry II	4
CA 116	Art for Living I	3	CH 103L	Gen. Chemistry Lab	1	CH 104L	Gen. Chemistry Lab	1
CA 116L	Art for Living Lab	2	CA 115	Clothing & Man	3	SC 211	Public Speaking	5
EH 101	English Comp.	3	CA 113	Housing for Man	3	HY*		3
NF 112	Nutrition & Man	3	EH 102	English Comp.	3	EH 103	English Comp.	3
			HY*		3			

SOPHOMORE YEAR

PS 200	Fnds. of Physics	5	CH 203	Organic Chemistry	5	CA 225	Textiles	5
PG 211	Psychology	5	CA 232	Home Equip. I	5	AT 111	Art Fund.	5
EC 200	Economics I	5	EC 202	Economics II	5	EH**		3
HY*		3	FCD 157	Fam. & Human Dev.	3		Lib. Ed. Electives	5

JUNIOR YEAR

CA 303	The House	5	CA 333	Lighting Design	5	CA 533	Home Equip. II	5
CA 313	Home Furnishings	5	CA 515	History of Textiles	5	CA 343	Interior Home Prob.	5
MT 331	Prin. of Mkt.	5	CA 398	Professional Planning and Development	1	CA 478	Visual Merchand.	3
CA 323	Man the Consumer	3	CA 216	Art for Living II	3		Prof. Elective	3
				Prof. Electives	3			

SENIOR YEAR											
CA	473	Contemp. Home Furn.	3	CA	336	Field Exp.***	5-15	CA	553	Cons. & the Mkt.	3
EHA	415	Writ. Bus. Comm.	3			Prof. Electives***	0-10	CA	431	Man-Environ. Rel.	2
		Prof. Electives	9							Prof. Electives	5
		Elective	3							Elective	8

TOTAL — 205 QUARTER HOURS

*Students may take any combination of Tech. and Civilization, HY 204-205-206; Art History, AT 171-172-173.

**Students may choose one course from English Lit., 253-255, or World Lit., 260-262.

***Students who take a 15 hour CA 336 Field Experience take 25 credit hours of professional electives. The reduced credit hours for CA 336 requires a compensatory increase of professional elective hours.

APPROVED PROFESSIONAL ELECTIVES

Minimum of 10 hours selected from: ACF 211, 323; CA 325, 514, 528, 535, 541, 583; MN 310, MT 241, 242, 332, 333, 337, 341; EC 555; JM 315; NF 104; EHA 315.

Minimum of 10 hours selected from: BSC 202; AR 360; AT 112, 371-379; ID 365, 366, 367; U 210, CA 375, 385, 575, 586; HF 221.

Department of Family and Child Development

The Department of Family and Child Development is concerned with the processes of growth and development of individuals in their daily living from infancy to old age and with the creation of techniques for facilitating such development. Its primary mission is the promotion of self-fulfillment of individuals and families through maximum utilization of material and human resources. One curriculum, including three options, is offered in this department: Infancy and Preschool, School-age and Adolescence, and Adult and Aging.

Curriculum in Family and Child Development (FCD)

Options: Infancy and Pre-school, School-age and Adolescence, Adult and Aging.

Required Courses — 124-135 hours

EH 101-102-103	English Comp.	9	CA 431	Man-Environment Relations	2
SC 273	Gr. Prob. Solving	5	NF 112	Nutrition and Man	3
HY 101-102-103	World History	9	FCD 157	Fam. & Hum. Dev.	3
SY 201	Sociology	5	FCD 267	Hum. Dev. I	4
PG 211	Psychology		FCD 269	Family I	4
	or		FCD 270	Family II	4
PG 213	Psychology of Adjust.	5	FCD 280	Hum. Dev. II	4
EC 200	Economics I	5	FCD 287	Careers in FCD	2
BI 105	Perspectives in Biology	5	FCD 300	Appro. Child Study	4
BI 106	Human Biology	5	FCD 301	Hum. Dev. III	5
CA 113	Housing for Man	3	FCD 302	Hum. Dev. IV	4
CA 115	Clothing and Man	3	FCD 306	Family III	4
CA 116	Art for Living I	3	FCD 347	Lab Exper. with Young Child	3
	Mathematics or Philosophy	5	FCD 420	Recent Resch. in Child Dev.	4
CA 323	Man the Consumer	3	FCD 477	Hum. Dev. V	3
CA 398	Professional Planning & Development	1	FCD 497	Dir. Fld. Exper.*	5-15

Electives 71-81 hours

Professional*	20-30
Liberal Education	18
General	33

TOTAL — 205 QUARTER HOURS

*Students focus on one of three options by taking 20-30 hours of specialized professional electives and a 5-15 hour directed field experience.

Department of Nutrition and Foods

The Nutrition and Foods major is designed for students having a strong interest in the health, physical growth, and welfare of people, and the ability to apply scientific principles to the solution of problems. The sociological, psychological, physiological, and economic aspects of food in nutritional status are integral parts of the program.

The department, through its majors in Coordinated Dietetics, Nutrition and Foods, Food Science, and Food Service Administration, prepares students for teaching, research, and health service careers in educational institutions, hospitals, industry, and government.

Food Science (FS)

The Food Science curriculum is designed for students interested in careers found in the nation's gigantic food industry. Students may use their electives for a general program or for specializing in a commodity such as meat, fruit or vegetable products. They may choose to emphasize business, technology, or science areas.

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
CH	103	Gen. Chem. & Lab. ....5	CH	104	Gen. Chem. & Lab. ....5	BI	101	Prin. of Biology ....5
MH	160	Pre-Cal. w/Trig. ....5	MH	161	An. Geom. & Cal. ....5	CH	203	Organic Chem. & Lab. ....5
FS	201	Intr. Food Sci. & Tech. ....3	EH	102	English Comp. ....3	EH	103	English Comp. ....3
EH	101	English Comp. ....3	HY	101	World History* ....3	HY	102	World History* ....3
		Elective ....1			Elective ....1			Elective ....1
			SOPHOMORE YEAR					
AEC	202	Agr. Econ. I ....5	BI	102	Plant Biology ....5	BI	103	Animal Biology ....5
HY	103	World History* ....3	EHA	304	Tech. Writing ....3	PG	211	Psychology ....5
NF	318	Nutr. Biochem. ....5	PS	200	Found. Phys. ....5	NF	372	Fund. of Nutr. ....3
		Elective ....5			Elective ....5	SC	211	Public Speaking ....5
			JUNIOR YEAR					
FS	355	Food Engineering ....5	FS	543	Food Chemistry ....5	FS	545	Food Analysis & Quality Control ....5
FS	340	Indust. Food Pres. Tech. ....5			Electives** ....12	FS	566	Food Microbiology ....5
MB	300	Gen. Microbiology ....5						Electives** ....8
		Electives** ....3						
			SENIOR YEAR					
FS	577	Food Plant Sani. ....4	FS	429	Food Sci. Sem. ....1			Electives** ....13
					Electives** ....16			Electives** ....18

TOTAL — 210 QUARTER HOURS

*HY 204-205-206 Tech. & Civil.; EH 260-261-262 Western World Literature; or AT 171-172-173 History of Art, may be substituted for HY 101-102-103.

**The student will complete a minimum of 56 hours, including 6 hours of Food Processing, from a list of recommended electives that is available in the offices of the adviser and dean and must be approved by them.

Food Service Administration (FSA)

The Food Service Administration major prepares students to manage food service operations.* Graduates qualify for ADA membership through administrative dietetics.

Curriculum in Food Service Administration (FSA)

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
MH	140	College Algebra or	NF	104	Principle of Food	CH	104	Gen. Chem. II ....4
MH	160	Pre-Cal. w/Trig. ....5			Prep. ....5	CH	104L	Gen. Chem. Lab. ....1
NF	112	Nutr. and Man ....3	CH	103	Gen. Chem. I ....4	NF	204	Meal Management ....5
CA	113	Housing for Man ....3	CH	103L	Gen. Chem. Lab. ....1	EH	103	English Comp. ....3
EH	101	English Comp. ....3	EH	102	English Comp. ....3			HY/AT/EH** ....3
		HY/AT/EH** ....3			HY/AT/EH** ....3			
			SOPHOMORE YEAR					
CH	203	Organic Chemistry ....5	BI	101	Prin. of Biol. ....5	BI	106	Human Biology ....5
PG	211	Psychology ....5	EC	200	Economics I*** ....5	EC	202	Economics II*** ....5
ACF	211	Accounting I ....4	SY	201	Intr. to Soc. ....5	SC	211	Fund. Speech Comm. ....5
EH		Literature Elective ....3	EHA	304	Tech. Writing or	CA	115	Clothing & Man ....3
			JM	315	Tech. Journalism ....3			

JUNIOR YEAR

MB 300	Gen. Microbiol. ....5	MT 241	Business Law I** ....4	EC 350	Labor Economics***.5
NF 564	Exper. Foods .....5	FCD 157	Fam. & Human Dev. ....3	MT 331	Prin. of Mkt. ....5
MN 310	Prin. of Managmt. ....4	CA 398	Prof. Planning and Development .....1	CA 323	Man the Consumer ....3
CA 116	Art for Living .....3		Prof. Electives .....5		Prof. Electives .....5
			Electives .....3		

SENIOR YEAR

NF 304	Quant. Food Prep. ....5	MT 341	Consumer Behavior ....5	NF 346	Food Ser. Org. & Mgt. ....5
MT 332	Mkt. Comm. Mgt. ....5	VED 513	Nature of Adult Ed. ....5		Prof. Elective .....5
	Lib. Ed. Elective .....5	ADS 577	Food Plant San. ....4		Elective .....8
	Elective .....3	CA 431	Man-Environ. Rel. ....2		

TOTAL — 205 QUARTER HOURS

*To qualify for ADA membership through therapeutic dietetics, students will be required to take NF 318, 382, 392, SY 220 and the professional electives listed for General Dietetics or Clinical Nutrition below the Nutrition and Foods curriculum.

**HY 204-205-206 Tech. & Civ.; EH 260-261-262, Western World Literature; or AT 171-172-173, History of Art may be substituted for HY 101-102-103.

***A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed from the School of Business.

Nutrition and Foods (NF)

Major areas of concentration in Nutrition and Foods include dietetics, nutrition, and experimental foods with minors in food science, teaching, chemistry, biology, journalism, radio and television, and others from which a student may select.

Curriculum in Nutrition and Foods (NF)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 140	College Algebra or		NF 104	Prin. of Food Prep. ....5		CH 104	Fund. of Chem. II ....4	
MH 160	Pre-Cal. w/Trig. ....5		CH 103	Fund. of Chem. I ....4		CH 104L	Gen. Chem. Lab. ....1	
BI 101	Prin. of Biology ....5		CH 103L	Gen. Chem. Lab. ....1		CA 115	Clothing & Man ....3	
EH 101	English Comp. ....3		EH 102	English Comp. ....3		EH 103	English Comp. ....3	
HY 101	World History ....3		HY 102	World History ....3		HY 103	World History ....3	
						NF 112	Nutrition & Man ....3	

SOPHOMORE YEAR

CH 203	Organic Chem. ....5	EC 200	Economics I* ....5	SC 211	Public Speaking ....5
PG 211	Psychology ....5	NF 204	Meal Mgt. ....5	ZY 251	Physiology ....5
SY 201	Intr. to Soc. ....5	ZY 250	Human Anatomy ....5	CA 116	Art for Liv. I ....3
CA 113	Housing for Man ....3		Lit. Electives .....3	FCD 157	Family & Hum. Dev. ....3

JUNIOR YEAR

NF 304	Quant. Food Prep. ....5	MB 300	Gen. Microbio. ....5	NF 346	Food Service Org. & Mgt. ....5
NF 318	Nutri. Biochem. ....5	NF 382	Prin. of Normal Nutrition I .....5	NF 392	Prin. of Normal Nutrition II .....5
MN 310	Prin. Mgt. ....4	SY 220	Statistics .....5	VED 466	Teaching Out of School Groups .....3
CA 323	Man the Consumer ....3	CA 398	Professional Planning and Development .....1		Prof. Electives* .....4
			Prof. Elective* .....3		

SENIOR YEAR

NF 564	Experimental Foods ....5		Prof. Electives* .....11	CA 431	Man-Environ. Rel. ....2
EHA 304	Tech. Writing or		Electives .....7		Prof. Electives* .....8
JM 315	Tech. Journalism ....3				Liberal Ed. Elective ....5
	Prof. Electives* .....3				
	Elective .....7				

TOTAL — 205 QUARTER HOURS

*A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed from School of Business.

Special areas of interest in Nutrition, Dietetics, Food Science, Communication in Food & Nutrition, Research, and Teacher Education may be developed through choice of elective courses.

American Dietetic Association educational requirements may be met by including one of the following groups of professional electives with the Nutrition and Foods curriculum:

A. General Dietetics		C. Management in Dietetics	
NF	502 Diet Therapy	4	
		ACF	211 Prin. of Acct.
		EC	202 Economics II
		EC	350 Labor Economics
		MN	442 Personnel Management
B. Community Nutrition		D. Clinical Nutrition	
ANT	203 Intr. to Anthro.	5	
NF	502 Diet Therapy	5	
NF	362 Prob. in Comm. Nutr.	5	
NF	358 Comm. & Fam Hlth	5	
		ZY	524 Animal Physiol.
		ANT	203 Intr. to Anthro.
		NF	592 Nutr. in Life Cycle
		NF	502 Diet Therapy

Coordinated Dietetics Program (CDP)

Upon completion of this program incorporating clinical experiences with classroom teaching, the student is eligible to take the examination to become a Registered Dietitian. This program is accredited by the American Dietetic Association.

Curriculum in the Coordinated Dietetics Program (CDP)

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
MH	140 College Algebra or	NF	104 Prin. of Food Prep.	CH	104 Fund. of Chem. I
MH	160 Pre-Cal. w/Trig.	CH	103 Fund of Chem. I	CH	104L Gen. Chem. Lab.
CA	113 Housing for Man	CH	103L Gen. Chem. Lab.	CA	115 Clothing & Man
EH	101 English Comp.	EH	102 English Comp.	EH	103 English Comp.
HY	101 World History*	HY	102 World History*	HY	103 World History*
NF	112 Nutrition & Man	CA	116 Art for Liv. I		Liberal Ed. Elective

SOPHOMORE YEAR

BI	101 Prin. of Biol.	ZY	250 Human Anatomy	PG	211 Psychology
CH	203 Organic Chem.	MB	300 Gen. Microbiology	SY	201 Intr. to Soc.
EC	200 Economics I	NF	204 Meal Mgt.	ZY	251 Physiology
FCD	157 Family & Human Dev.	EH	Lit. Elective	CA	323 Man the Consumer

JUNIOR YEAR

NF	564 Experimental Foods	NF	316 Food Svc: Plan.,	NF	432 Med. Dietetics
NF	318 Nutr. Biochem.		Prod., & Mgt.	NF	392 Prin. of Normal
MN	310 Prin. of Mgt.	NF	382 Prin. of Normal		Nutrition II
NF	307 Survey of Dietetics		Nutrition I	VED	466 Tch. Out-of
		CA	398 Professional Planning		School Groups
			and Development		

SENIOR YEAR

NF	442 Adv. Med. Dietetics	NF	422 Comm. Nutrition	NF	485 Admin. Dietetics
NF	592 Nutr. in Life Cycle	CA	431 Man-Environ. Rel.	CA	350 Compr. Appl. H. Ed.
			Elective		

TOTAL — 205 QUARTER HOURS

*HY 204-205-206 Tech. & Civil.; EH 260-261-262, Western World Literature; or AT 171-172-173, History of Art may be substituted for HY 101-102-103.

Dual Objective Program with the School of Education

Dual objective programs with the School of Education (see p. 133) are open to students registered in the School of Home Economics in the following five majors:

Family and Child Development
Clothing, Textiles and Related Art
Nutrition and Foods

Family Resource Management
Family Economics
Interior Furnishings and Equipment
Housing

Option in Cooperative Extension

Students enrolled in any of the majors in the School may prepare for a career in the Cooperative Extension Service through selection of certain courses as electives. The major of Family Resource Management meets the requirements of this option. Other majors may also fulfill the requirements of the Alabama Cooperative Extension Service through scheduling of the following courses:

NF-104, 112, 204, 324, 362

CA-105, 206, 233, 343, 225 or 335, 541, 570

FCD-267, 467

EM-200

The Alabama Cooperative Extension Service requires that Extension Home Economists have a minimum of 70 hours of home economics courses above the 100 level.

Graduate Work

The School offers work leading to the Master of Science degree, Master of Arts in College Teaching degree, and the Ph.D. degree in Experimental Nutrition, an inter-departmental program.



School of Nursing

H. TERRI BROWER, *Dean*

THE SCHOOL OF NURSING, established in 1978-79, offers a program of preparation leading to the degree of Bachelor of Science in Nursing.

The nursing curriculum is designed to prepare the beginning professional nurse as a generalist ready to assume responsibility as a member of the health-care team in providing care for individuals and groups. The program is planned to provide an educational base which allows for advancement in formal study, research, and practice. The facilities and resources of the University are utilized to provide a broad academic background in the humanities and sciences. Graduates are eligible to take the State Board Test Pool examination to become registered nurses.

A pre-professional program in Nursing Science is required of all students seeking admission to the professional curriculum. The first two years of course work are designated as Pre-Nursing (NS). The Professional Program (NUR) requires seven quarters of course work, laboratory and clinical experience.

Curriculum in Pre-Nursing Science (NS)

LEVEL I		
First Quarter		
EH 101	English Comp.	3
HY 101	World History	3
BI 101	Prin. of Biology	5
MH 140	College Algebra or	
MH 160	Pre. Cal. w/Trig.	5
NUR 101	Orientation	1
Second Quarter		
EH 102	English Comp.	3
HY 102	World History	3
PG 211	Psychology	5
CH 101	Intr. Chem. I*	2
	Elective**	5
Third Quarter		
EH 103	English Comp.	3
HY 103	World History	3
SY 201	Intr. to Soc.	5
CH 102	Intr. Chem. II	2
CH 103L	Gen. Chem. Lab.	1
	Physical Educ.	2
LEVEL II		
BI 103	Animal Biology or	
ZY 250	Human Anatomy	5
CH 104	Fund. of Chem. II	5
ANT 203	Intr. to Anthro.	5
	Literature Elec.	3
ZY 251	Physiology	5
CH 203	Organic Chem.	5
PG 212	Devel. Psych. or	
FCD 330	Lifespan Human Dev.	5
	Elective**	3
BY 300	Gen. Microbiol. or	
BY 302	Med. Microbiol.	5
NF 372	Fund. of Nutr. or	3
NF 318	Nutr. Biochem.	5
SY 301	Socio. of Fmly. or	5
FCD 270	Family II	4
PA 218	Ethics & Hlth. Sc.	5

TOTAL — 104 QUARTER HOURS

Curriculum in Professional Nursing (NUR)

LEVEL III		
NUR 301	Proc. Fund. to Nursing.	10
NUR 380	Pharmacology in Nursing	4
CED 422	Hum. Rel. Trn. for Health Prof.	4
NUR 311	Adult Health Nursing I	14
NUR 350	Phys. Assessment in Hlth. and Illness	5
NUR 321	Maternal-Infant Hlth. Nsg.	12
	or	
NUR 331	Child Hlth. Nsg.	12
	Elective**	3
Fourth Quarter		
NUR 321	Maternal-Infant Hlth. Nsg.	12
	or	
NUR 331	Child Hlth. Nsg.	12
	Elective**	3
NUR 340	Dir. in Nursing	3
LEVEL IV		
NUR 442	Adult Health Nursing II	12
FED 370	Statistics	3
NUR 482	Research in Nsg.	3
NUR 412	Psych/Mental Hlth. Nsg.	8
NUR 422	Community Hlth. Nursing	7
NUR 499	Preceptorship	14
NUR 495	Management in Nursing	3
NUR 450	Senior Seminar	2

TOTAL — 226 QUARTER HOURS***

*Students should take CH 101 unless they have had high school chemistry and scored at least 25 on the ACT or 1130 on the SAT. See adviser for study plan taking CH 103.

**Electives may be chosen from any field.

***Required for graduation.

Admission

Freshman eligibility is determined by the University Admissions Office. Admission requirements are stated elsewhere in the Bulletin. High school preparatory courses in math (Algebra I and II and Plane Geometry) are required for admission to the pre-nursing curriculum. Students who do not have these courses will be admitted to the General Studies curriculum until a preparatory mathematics course is taken. High school chemistry and biology courses are strongly recommended, along with other college preparatory courses in social science, history, literature and English composition.

Transfers from other institutions must apply through the University Admissions Office. Review of transcripts by the School of Nursing will determine the amount of credit allowed for the pre-nursing requirements. Students planning to transfer are encouraged to contact the School of Nursing as soon as possible for advisement concerning transferability of credits.

Registered nurses: The School of Nursing offers advanced placement for R.N. students pursuing the B.S.N. degree. Registered nurse students must complete the pre-nursing curriculum required of all nursing majors. Advanced placement within the third and fourth levels is determined by standardized testing. The School of Nursing should be contacted for further advisement.

Professional Program: Pre-nursing students must formally apply in February to the School of Nursing. March 1 is the deadline for submission of application. Applicants are notified by April 15 of acceptance or non-acceptance. If the number of qualified applicants exceeds the spaces available, a waiting list will be established for the Fall Quarter of that academic year only. Admission to the professional program is open annually in the Fall Quarter. Due to limited enrollment, all students who meet minimal criteria may not be admitted.

Criteria for consideration for admission include a minimal grade average of 2.50, completion of the pre-nursing requirements, references, date of enrollment in Auburn University at Auburn, and a completed application. The Admissions Committee considers, in addition to the above criteria, general conduct, health, and extra-curricular activities. An interview may be required by the School of Nursing.

Academic Regulations

An adviser from the faculty or staff is assigned to each student majoring in nursing. Academic program planning is done with the advisers. Students should consult with their advisers each quarter.

Advanced standing (CLEP credit) in pre-nursing courses is granted in the humanities, English, and math according to University policies stated elsewhere in the *Bulletin*. No CLEP credit is allowed in the natural sciences by the School of Nursing.

An overall grade average of 2.0 must be maintained for progression through the program. Pre-nursing students who do not attain an overall grade average of at least 2.0 at the beginning of the second year should consider alternative fields of study. A minimum grade average of 2.5 is required for consideration for admission to the professional program. An overall grade average of at least 2.0 is required of students desiring to transfer into the School of Nursing from another curriculum on campus.

A grade of "C" is required in courses in English, math, philosophy, behavioral sciences, the natural sciences, and nutrition. Transfer credit will not be granted for courses in which a grade less than "C" is earned.

In the professional program of the School of Nursing, a minimal grade of "C" must be achieved in all courses except electives. If a grade less than "C" is received, the student may repeat the course one time only. Students who do not satisfactorily complete a major clinical course and whose GPA falls below a 2.0 will be dropped from the professional program and must reapply. Transfer credit is not generally allowed for courses in the Professional Program.

The Professional Program

Facilities

The School of Nursing is housed in Miller Hall, where classrooms, a skills laboratory, a learning resource center, and faculty offices are located.

Facilities for clinical nursing experiences include East Alabama Medical Center and other hospitals in the area, Lee County Mental Health Center, clinics, nursing homes, physicians' medical complex, Lee County Public Health Department, public schools and industrial sites.

Note: Students are responsible for complying with policies and procedures required by agencies in which clinical work is done.

Expenses

Additional expenses will be incurred by students accepted into the professional program. Uniforms, equipment, transportation to clinical sites, a health examination, and liability insurance coverage are among the requirements. Detailed information is furnished by the Dean's Office at the time of admission.

Accreditation

The School of Nursing has received full approval, with commendation, of the Alabama Board of Nursing, and is accredited by the National League for Nursing.



School of Pharmacy

BEN F. COOPER, *Dean*
CHARLES M. DARLING, *Associate Dean*

THE SCHOOL OF PHARMACY offers two professional degrees and a graduate degree. The professional degrees are a fully accredited program leading to a Bachelor of Science in Pharmacy and a Doctor of Pharmacy program leading to a Pharm.D. The graduate degree, a Master of Science, is described in the Graduate School Bulletin.

The Bachelor of Science Curriculum requires three years in the professional school after completion of two years in the pre-professional program. The Doctor of Pharmacy program requires one continuous year of course work beyond the baccalaureate program.

The undergraduate degree in pharmacy is a necessary requisite for licensure for the practice of pharmacy in each of the 50 states and also the territories of the United States. In addition, completion of the program prepares students for careers in those areas of pharmacy not requiring licensure.

Pharmacists provide those personal health services that assure safety and efficacy in the procuring, storing, prescribing, compounding, dispensing, delivering, administering, and use of drugs and related articles. Among these services are maintenance of patient medication profiles, monitoring of drug therapy, counseling patients in matters of health, and providing health and drug information for nurses, physicians, and other health care practitioners.

Opportunities for graduates exist in community pharmacy, institutional pharmacy, industrial pharmacy (research, product development, analytical control, product manufacture, sales, and distribution), wholesale pharmacy, public health, health care funding agencies, and regulatory agencies. In addition, there are opportunities in research and teaching in an academic environment.

Admission

The course requirements for admission to the School of Pharmacy may be satisfied by completion of the six quarter prepharmacy curriculum as outlined on page 183. Any or all of these requirements may be met by transfer of credit from other institutions. Transfer students from junior colleges may receive no more than 102 quarter hours credit for the prepharmacy curriculum.

Admission is limited and is contingent upon available facilities and faculty. To be considered for admission the applicant must have a satisfactory grade point average based on all courses attempted as well as a satisfactory science index (grade point average on the biological and physical science courses). A grade of D on any required course will not be accepted.

Students are accepted into the School of Pharmacy twice annually, Fall and Spring. Spring Quarter applications for admission to the School of Pharmacy should be submitted not later than December 1, while Fall Quarter applications should be submitted not later than April 1. To be considered for admission to the School of Pharmacy, the applicant must forward to the Pharmacy Admissions Committee a completed application, a photograph, two interview report forms, two letters of recommendation, Pharmacy College Admissions Test scores (PCAT should be taken in November for Spring Admission and in February for Fall Admission), and complete transcripts of all work attempted, along with a list of courses in progress and courses planned before entrance into the pharmacy curriculum. Applicants must appear for a personal interview with the Pharmacy Admissions Committee upon request. Applicants will be notified as to acceptance or rejection no later than February 15, for Spring Admission and July 15, for Fall Admission.

If applicants have not previously attended Auburn University, they must also be accepted by the Admissions Office before their application to the School of Pharmacy can be considered. For University applications write Admissions Office, Auburn University, Auburn, Alabama, 36849-3501.

Any student in the pharmacy curriculum who is subjected to academic suspension and desires to re-enter the School of Pharmacy must, in addition to complying with the pertinent University regulations, be approved by the Pharmacy Admissions Committee for re-admission.

Guidelines to Academic Performance for Pharmacy Students

I. GENERAL

- A. The implementation of all guidelines will be in addition to that of existing policies and standards of the University.
- B. Grade point averages will be calculated only from professional coursework. *Professional coursework* is defined as those required and elective courses listed in the "Curricula" in Pharmacy: Bachelor of Science" outlined on page 183 of this *Bulletin*.
- C. The student must observe prerequisites and corequisites stated in the current *AU Bulletin*.
- D. To enroll in a previously failed Pharmacy course, the student must obtain the approval of the appropriate Department Head.
- E. A student may not add a Pharmacy course after five academic class days.
- F. If a student drops a Pharmacy elective course after five academic class days, the student will not be allowed later to enroll in that course.

II. PROGRESSION

- A. A student must earn passing credit in at least 12 hours of professional coursework to receive one quarter of residency credit. The student who earns passing credit in 6-11 hours of professional coursework will receive one-half quarter of residency credit.
- B. Students must achieve a minimal GPA cumulative record of 2.00 by the end of each professional year in order to progress to the subsequent professional year. Students may not progress if their GPAs within a given professional year are below 2.00 by the end of that particular year. For example, students who achieve a 3.00 GPA in the 03PY year, then achieve a 1.90 GPA in the 04PY year may not progress to the 05PY year, even though their overall pharmacy GPA is above 2.00.
 1. All "F" graded required courses in the 03, 04 or 05PY years must be successfully repeated.
 2. The required number of hours of professional electives must be successfully completed in each professional year in order for the student to progress to the next professional year.
 3. A course in which a student receives a grade of "B" or "A" may not be repeated under any conditions.
 4. A course in which a grade of "C" has been earned may be repeated only if all courses in which an "F" or "D" had been earned have been successfully repeated with a "C" or above grade.
 5. No required course in the professional curriculum may be repeated more than twice.
 6. If the 2.00 GPA is not achieved in three additional (for a total of six) quarters of enrollment, the student will be dropped from the rolls of the School of Pharmacy for scholastic deficiency.

III. SUSPENSION

- A. An academic suspension by the School of Pharmacy may be appealed to the Professional and Academic Standards Committee. Reinstatement is subject to approval by the Pharmacy Admissions Committee.
- B. Two failure grades ("F" or "U") in one or more courses within a period of five consecutive enrollment quarters will result in two quarters of suspension by the School of Pharmacy.
- C. After reinstatement, two additional failure grades will result in a second suspension by the School of Pharmacy.
- D. After two suspensions by Auburn University or the School of Pharmacy (i.e. two suspensions by either or one suspension by each), the student will be dropped from the rolls of the School of Pharmacy.

Curriculum Options

After the completion of the second professional year, students may choose a curriculum option which provides specialized knowledge in the areas of community pharmacy, institutional pharmacy, or graduate studies. Faculty advisers will provide guidance in the selection of curriculum options and the selection of appropriate courses of instruction within these options. Each of the options will adequately prepare students for licensure examinations.

Licensure Requirements

The Alabama State Board of Pharmacy (BOARD) regulates (ACT 205) the practice of pharmacy in the state. In brief the requirements for licensure are:

1. B.S. in Pharmacy or Pharm.D. degree from an accredited School of Pharmacy.
2. A total of 1,500 hours of practical experience under the supervision of a registered preceptor, 400 hours of which must be completed after graduation. A maximum of 400 hours of the 1,100 hours which can be earned prior to graduation may be completed while concurrently enrolled in pharmacy school.
3. Students are eligible to and should file an application with the BOARD for registration as an extern/intern at the time they enroll in the School of Pharmacy. Periods of any work experience should be reported to the Secretary of the Board within 10 days of beginning and within 10 days after ending the experience, or at intervals of 16 weeks, whichever first occurs.
4. Graduates of Schools of Pharmacy are eligible to take the theoretical portion of the BOARD examination anytime after graduation and are eligible to take the practical portion upon completion of the extern/intern requirements. Applications for taking the BOARD examinations may be picked up at the Office of the Dean anytime after graduation.
5. The Office of the Dean of the School of Pharmacy will be glad to respond to questions on licensure. Alternatively, request for information can be referred directly to: Mr. J. W. McLane, Secretary, Alabama State Board of Pharmacy, 2312 City Federal Building, Birmingham, Ala. 35203.

Continuing Education and Extension Services

Continuing education and extension service programs are available to pharmacists throughout the year. Faculty members of the School of Pharmacy, as well as practicing pharmacists and industry leaders, and consultants in state and federal governmental agencies, serve as instructors.

The Alabama Board of Pharmacy has adopted a regulation, which requires 15 clock hours of approved continuing education as a requirement for renewal of each pharmacist's controlled substances permit.

Curricula In Pharmacy

BACHELOR OF SCIENCE

FIRST PROFESSIONAL YEAR

First Quarter			Second Quarter			Third Quarter		
ZY	560	Mammalian Phys. I5	ZY	561	Mammalian Phys. II5	PC	347	Human Pathology5
CH	301	Biochemistry5	CH	302	Biochemistry5	BY	302	Med. Microbiol.5
PY	301	Pharmaceutics I5	PY	302	Pharmaceutics II5	PC	346	Clin. Eval. Drug Ther.3
		Elective*3	PCS	361	Drug Lit. Anal.3	PY	316	Mod. Meth. Drug Anal. 4

SECOND PROFESSIONAL YEAR

Fourth Quarter			Fifth Quarter			Sixth Quarter		
PY	420	Med. Chem. I5	PY	421	Med. Chem. II4	PY	422	Med. Chem. III5
PY	531	Pharmacology I5	PY	532	Pharmacology II5	PY	533	Pharmacology III4
PY	401	Pharmaceutics III5	PY	432	Chem. Ph'col. Lab.1	PY	433	Chem. Ph'col. Lab.1
PCS	471	Prof. Comm. I3	PC	447	Therapy of Disease I3	PC	448	Therapy of Disease II3
			PCS	562	Intr. Med. Info. Syst.3	PY	403	Pharmaceutics IV3
			PC	452	Drug Info. Orient.2			Prof. Elective3

THIRD PROFESSIONAL YEAR

PC	457	Drug Interactions3	PCS	360	Pharmacy Convoc.0	PC	459	Externship18
PC	449	Drug Therapy in Clinical Practice5	PCS	465	Phar. Oper. Sys.5			
					Prof. Electives**13			
PCS	464	Jurisprudence5						
PCS	360	Pharmacy Convoc.0						
PY	535	Toxicology5						

*Elective Credit is restricted to courses offered by the Departments of Philosophy and Psychology.

**Doctor of Pharmacy students must elect PY 502 Pharmacokinetics.

TOTAL — 162 QUARTER HOURS (B.S.)

NOTES:

1. Proficiency in typing is required of all entering students.
2. Students must participate in field trips to a pharmaceutical manufacturing plant during their junior or senior year, and to a wholesale drug company during their senior year.
3. A set of Class C, metric and Apothecaries' weights, which may be purchased from Pharmacy Supply, is required for all Pharmacy laboratories.
4. Students will be required to spend one quarter of their third professional year in an off-campus, structured, externship experience.
5. Students enrolled in clinical or externship courses are required to furnish personal professional liability insurance.
6. All pharmacy elective courses are acceptable for option credit. Faculty advisers will provide information on any non-pharmacy elective courses which are acceptable.
7. Students who are qualified and have the prerequisites may take up to 10 hours of graduate courses in their fifth year; however, such work cannot be applied toward both the undergraduate and graduate degrees.
8. After completion of the Second Professional year, students must obtain satisfactory scores (minimum: raw score of 40 on each section) on the Basic Pharmaceutical Sciences Examination.

Doctor of Pharmacy

Qualified students enrolled in the B.S. program at Auburn may be considered for entry into the Doctor of Pharmacy program upon completion of the Seventh Quarter of the baccalaureate curriculum in pharmacy and acceptance by the Doctor of Pharmacy Admissions Committee. Graduates of other accredited schools/colleges of pharmacy are eligible for the program and may apply to the Doctor of Pharmacy Admissions Committee. While the program is designed to interface with the baccalaureate program such that in the future the Pharm. D. may become the single entry degree, at this time the program is in addition to the baccalaureate program and of limited enrollment.

The program of study is conducted at the University of Alabama Hospitals in Birmingham and consists of one continuous calendar year (52 weeks) of course work. The program begins in June of each year and ends in June of the following year with five weekday holidays granted. Ninety quarter credit hours of work are required in this program which is equivalent to five academic quarters.

Doctor of Pharmacy Curriculum

Summer Session*		Fall-Winter-Spring Session*	
PC	461 Intr. to Clin. Environment	PC	465 Clin. Seminar
	5		1
PC	462 Applied Pharmacokinetics		Clerkships
	3		72
PC	463 Adv. Therapeutics		
	6		
PC	464 Drug Info. Retrieval & Analysis		
	3		

*The two sessions are completed in one calendar year equivalent to five academic quarters.

TOTAL — 90 QUARTER HOURS



School of Veterinary Medicine

J. THOMAS VAUGHAN, *Dean*

H. C. MORGAN, *Associate Dean, Administration & Academic Affairs*

S. D. BECKETT, *Associate Dean, Research & Graduate Studies;*

Coordinator of Animal Health Research

F. F. HARSHBARGER, JR., *Assistant to the Dean*

THE SCHOOL OF VETERINARY MEDICINE offers a fully accredited program of training leading to the degree of Doctor of Veterinary Medicine. The curriculum requires four years in the professional school after completion of a pre-professional course curriculum which now take more than four years for the average applicant.

Admission

Although the largest percentage of students admitted are residents of Alabama, some spaces are available for non-Alabama students. Most of these are by contract through the Southern Regional Education Board (SREB), but a limited number of non-Alabama students not under a contract program with Auburn University may be accepted. Individuals in this category must have a minimum grade-point average of 3.0 on a 4.0 scale, must possess exceptional qualifications and pay non-resident university fees. Alabama and SREB students must have a minimum grade-point average of 2.50 on a 4.00 system on all coursework attempted and on all required courses. A grade of D on any required course will not be accepted. In addition the Committee on Admissions and Standards of the School of Veterinary Medicine may require a personal interview, a reading comprehension test or an examination on any required course. The School of Agriculture and the School of Arts and Sciences offer Pre-Veterinary curricula and are responsible for pre-veterinary counseling. Although farm experience and work with veterinarians are not absolute requirements for admission, applicants are urged to gain such training. Students without this experience frequently have difficulty with certain courses, particularly in the clinical areas.

Application for admission to either pre-veterinary curriculum should be made directly to the Admissions Office, Auburn University. Application for admission to the School of Veterinary Medicine, except for SREB students, should be made to the Chairman of Admissions, School of Veterinary Medicine, Auburn University, AL., 36849. SREB students must apply through their appropriate state agency.

Minimum Requirements for Pre-Veterinary Medicine

1. COMPLETION OF THE LIBERAL EDUCATION PROGRAM as stated on page 11 of this bulletin.
2. SPECIFIC COURSE REQUIREMENTS: Minimum pre-veterinary requirements for Alabama residents are exactly as listed for the pre-veterinary curriculum on page 93. The program in the School of Agriculture has the same courses, but they are distributed over nine quarters. Non-Alabama and SREB applicants must have acceptable equivalents which have been approved by the School of Veterinary Medicine. Individuals taking the pre-veterinary curriculum are expected to declare an academic major prior to their 5th quarter of enrollment.
3. ALL TRANSFER COURSES must be equivalent in hours and content. CLEP substitutions are acceptable as stated in this catalog but only for biology, mathematics, history and humanities. English credit can only be earned as stated on page 11. Courses will not be waived on the basis of degrees or "practical experience." Pass-Fail or Satisfactory-Unsatisfactory grades are not acceptable in required courses. Consideration will not be extended to anyone with an overall or required course grade point average of less than 2.50 at the time of application.
4. TIME LIMITATION: All required courses in the advanced physical and biological science categories must have been completed within six calendar years prior to the anticipated date of enrollment in the School of Veterinary Medicine.

Application Procedure

Admission of Alabama residents to the School of Veterinary Medicine must be gained through formal application made between September 15 and October 15 preceding the Fall Quarter in which admission is desired. The length of residence of Alabama applicants shall be a factor. The final date for accepting applications from non-Alabama students is November 1 and SREB applicants should consult their advisers for their exact dates.

Application packets, available from the School of Veterinary Medicine or the Kentucky advisers, contain all materials necessary as well as the instructions for making application. A processing fee of \$25.00 is required of all applicants, and an additional \$15.00 is required of all who have not previously attended Auburn University.

If students are admitted to the School of Veterinary Medicine, they must submit one completed physical examination report on a form supplied by Auburn University at least three weeks prior to date of registration (not required by students formerly enrolled at Auburn University) and two supplemental official transcripts of any work completed after application is filed.

The final selection of students is made by the Committee on Admissions and Standards of the School of Veterinary Medicine, Auburn University. These selections are made from the applicants who have been certified by the committees in the respective states after giving due consideration to scholastic record and general adaptability for the profession. The right is reserved to accept or reject any applicant.

MICROSCOPES — In order to be admitted to the School of Veterinary Medicine, a student must own a compound microscope acceptable to the faculty. The student must furnish a microscope in all courses requiring the use of this instrument.

ADMISSION UNDER THE REGIONAL PLAN — Under the Regional Plan for Veterinary Training, the School of Veterinary Medicine currently serves two states: Alabama and Kentucky.

The Land-Grant institution in each state participating under the SREB plan maintains counseling and guidance service for students desiring admission to the School of Veterinary Medicine. Students attending other institutions should contact the Land-Grant School adviser in their state for information concerning admission requirements.

Scholastic Requirements

All applicants and students in the professional program are subject to the academic and disciplinary regulations of the School of Veterinary Medicine in addition to those of Auburn University.

Any student who earns less than a 2.25 grade-point average for any quarter will be placed on academic probation. A student who fails to earn a 2.25 grade-point average in each of the succeeding two quarters of enrollment may be dropped from the rolls of the School of Veterinary Medicine for scholastic deficiency. In addition, a student who does not have an overall average of 2.25 for an academic year or who does not have a veterinary school cumulative average of 2.25 at the end of any academic year may be required to withdraw from the School of Veterinary Medicine.

A student who makes a grade of F on any course may be required to withdraw from the School of Veterinary Medicine until such time as the course is offered again. Such a student may be required to repeat certain other courses in the curriculum for that quarter.

Clinical courses are unique in that the art and skills to be developed in them can only be acquired by full participation in the laboratories. The attendance in these courses is required except in case of illness or other extenuating circumstances as may be judged by the involved instructor. The grading in these clinical laboratory courses is primarily by subjective evaluation. When a course involves student rotation through several disciplines or sections, the student must receive a passing grade in each area before a passing grade can be given for the course.

The responsibility for counseling is shared by the Faculty of this School and the Career Development Service.

Required Withdrawal

The faculty of the School of Veterinary Medicine reserves the right to require the withdrawal at any time of any student who in the judgment of the admissions and standards committee is not profiting from the instruction offered, who is neglectful, irregular, dishonest or indifferent in the performance of required duties and studies, or whose character or conduct is inconsistent with good order of the veterinary school or with the standard of the veterinary profession.

Requirements for Graduation

To be eligible for the D.V.M. degree, candidates must complete all of the required courses in the order listed in the curriculum in veterinary medicine with a minimum overall grade-point average of 2.25. Following completion of all academic work, each student will be required to serve a preceptorship of one quarter with a reputable practicing veterinarian. A certificate of satisfactory completion of a preceptorship will be required for graduation.

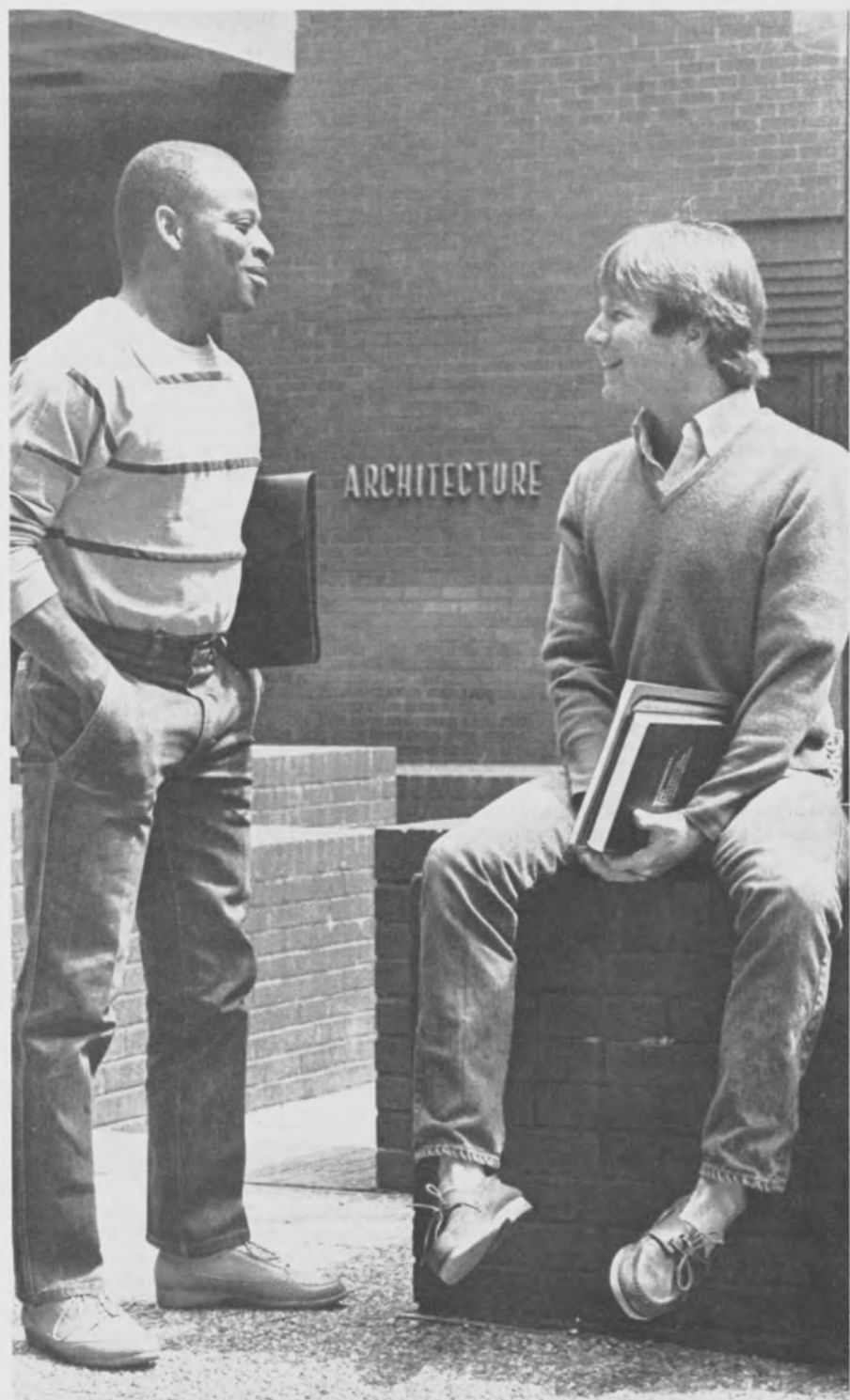
A graduation fee of \$15.00 must be paid at the beginning of the quarter of graduation and all indebtedness due the institution must be paid prior to graduation.

Curriculum in Veterinary Medicine (VM)

FIRST YEAR		
First Quarter		
VM 320	Anatomy I	5
VM 326	Micro. Anat. I	5
VM 313	Physiology I	5
VM 314	Physiology II	2
VM 300	Orientation	2
Second Quarter		
VM 321	Anatomy II	5
VM 327	Micro. Anat. II	5
VM 315	Physiology III	5
VM 316	Physiology IV	4
Third Quarter		
VM 322	Anatomy III	5
VM 328	Micro. Anat. III	4
VM 318	Physiology VI	4
VM 331	Vet. Micro. I	4
VM 319	Pharmacology I	2
VM 318L	Physiology Lab. III	1
SECOND YEAR		
VM 405	Pathology I	5
VM 411	Vet. Micro. II	4
VM 403	Physiology VII	4
VM 409	Vet. Parasitology I	4
VM 401	Pharmacology II	3
VM 428	Phy. Diagnosis	2
VM 406	Pathology II	5
VM 410	Vet. Parasitol. II	5
VM 402	Pharmacology III	4
VM 412	Vet. Micro. III	5
VM 404	Physiology VIII	3
VM 429	Phy. Diagnosis	1
VM 423	Clinical Path.	5
VM 414	Vet. Med. I	5
VM 407	Pathology III	4
VM 413	Preventive Med.	4
VM 408	Lab. An. Md.	3
VM 434	Appl. Anatomy	2
THIRD YEAR		
VM 420	Vet. Med. II	5
VM 424	Vet. Med. & Surg. I	6
VM 421	Vet. Surg. I	3
VM 427	Vet. Med. & Surg. II	3
VM 431	Vet. Radiology	4
VM 448	Vet. Surgery III	2
PH 422	Avian Diseases	5
VM 425	Vet. Med. & Surg. II	5
VM 438	Vet. Med. IV	4
VM 422	Vet. Surg. II	3
VM 451	Public Health II	2
VM 432	Vet. Mycology	2
VM 449	Vet. Surgery IV	2
VM 440	Clinics VII	6
VM 444	Clinics II	7
VM 435	Theriogenology	5
VM 453	Seminar	2
FOURTH YEAR		
VM 437	Vet. Med. III	5
VM 441	Clinics VIII	6
VM 445	Clinics III	7
VM 453	Seminar	2
VM 442	Clinics IX	6
VM 446	Clinics IV	7
VM 453	Seminar	2
VM 439	Vet. Med. V	5
VM 443	Clinics X	6
VM 447	Clinics V	7
VM 430	Jurisp. & Ethics	2
VM 452	Public Health III	2
VM 453	Seminar	2
Spring Quarter		
VM 454	Preceptorship	0
TOTAL — 252 QUARTER HOURS		

Graduate Programs

Master of Science degrees are offered in each department in the School of Veterinary Medicine. The Doctor of Philosophy degree is offered in a school-wide program. Refer to the *Graduate School Bulletin* for further information.



The Graduate School

PAUL PARKS, *Vice President for Research & Dean*

DON RICHARDSON, *Associate Dean*

MARYLU K. MCEWEN, *Assistant Dean*

A STUDENT with a bachelor's degree from an accredited college or university may apply to the Dean of the Graduate School for admission. Application forms for admission may be secured from the Graduate School and must be submitted at least three weeks before registration.

The *Graduate School Bulletin* should be consulted for detailed information on the regulations of the Graduate School, the courses offered for graduate credit, the requirements for degrees, fellowships and assistantships, and other matters pertaining to graduate work in this institution. Undergraduates wishing to register for graduate courses should consult the *Graduate School Bulletin* for regulations concerning such registration. A bulletin may be obtained upon request from the Dean of the Graduate School.

Graduate Degrees

The Master's Program

Master of Science degrees are offered in the areas of Accounting and Finance; Aerospace Engineering; Agricultural Economics and Rural Sociology; Agricultural Engineering; Agronomy and Soils; Anatomy and Histology; Animal and Dairy Sciences; Botany, Plant Pathology and Microbiology; Business; Chemical Engineering; Chemistry; Civil Engineering; Communication Disorders; Computer Science and Engineering; Consumer Affairs; Counselor Education; Curriculum and Teaching; Economics; Educational Leadership; Educational Media; Electrical Engineering; Entomology; Family and Child Development; Fisheries and Allied Aquacultures; Forestry; Geology; Health, Physical Education and Recreation; Horticulture; Industrial Engineering; Large Animal Surgery and Medicine; Management; Marketing and Transportation; Materials Engineering; Mathematics; Mechanical Engineering; Microbiology; Nuclear Science; Nutrition; Nutrition and Foods; Ornamental Horticulture; Pathology and Parasitology; Pharmacal Sciences; Pharmacy Care Systems; Physics; Physiology; Physiology and Pharmacology; Poultry Science; Psychology; Radiology; Rehabilitation and Special Education; Small Animal Surgery and Medicine; Sociology; Toxicology; Vocational and Adult Education; Wildlife Management; and Zoology.

Master of Arts degrees are offered in the areas of English; French; History; Political Science; Sociology; Spanish; and Speech Communication.

Other Master's Degrees: Master of Agriculture, Master of Aquaculture, Master of Arts in College Teaching, Master of Business Administration, Master of Communication Disorders, Master of Community Planning, Master of Education, Master of Fine Arts, Master of Forestry, Master of French Studies, Master of Hispanic Studies, Master of Industrial Design, Master of Industrial Engineering, Master of Materials Engineering, Master of Mechanical Engineering, Master of Music, Master of Probability and Statistics, Master of Public Administration, Master of Speech Communication.

The Doctoral Degree Program

The Doctor of Education degree is offered in the departments of Counselor Education, Curriculum and Teaching, Educational Leadership, Health, Physical Education, and Recreation, Rehabilitation and Special Education, and Vocational and Adult Education.

The Doctor of Philosophy degree is offered in the Departments of Aerospace Engineering, Agricultural Engineering, Agronomy and Soils, Animal and Dairy Sciences, Botany, Plant Pathology and Microbiology, Chemical Engineering, Chemistry, Civil Engineering, Computer Science and Engineering, Counseling Psychology, Electrical Engineering, English, Fisheries and Allied Aquacultures, Forestry, History, Industrial Engineering, Mate-

rials Engineering, Mathematics, Mechanical Engineering, Physics, Poultry Science, Psychology, Wildlife Management, and Zoology-Entomology, and interdepartmental programs in Economics, Nutrition, Physiology, and Veterinary Medicine.

Research Program with the ORAU

Auburn University is one of the sponsoring institutions of the Oak Ridge Associated Universities research program located at Oak Ridge, Tennessee. Through this cooperative association Auburn's graduate research programs have at their disposal the facilities of the National Laboratories in Oak Ridge and the research staffs of these laboratories.

Information on the opportunities for research in the Oak Ridge Laboratories is available in the office of the Dean of the Graduate School.

Interdepartmental and Interdisciplinary Curricula

Undergraduate

Environmental Science (ENS)

THE CURRICULUM in Environmental Science is an interdepartmental program administered by a faculty committee from the Schools of Agriculture, Education, Engineering, Home Economics and Pharmacy and is based on the strengths of Auburn University in the biological and physical sciences.

Environmental science specialists are employed by industries, consultants, trade associations, and by governmental agencies to work in areas such as food sanitation, water supply sanitation, institutional sanitation, refuse and waste control, air pollution control, hazardous materials management, radiation health physics, industrial hygiene and biological safety.

The program leading to a Bachelor of Science degree is designed to prepare graduates for careers in the broad field of environmental science. Students desiring to incorporate an engineering or computer science base into this program are strongly encouraged to do so. For further details concerning the program, interested students should contact Fred Moore, P.E., Director of the Office of Safety and Environmental Health (205/826-4870; 300 Nuclear Science Center).

Curriculum in Environmental Science

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH	103	Fund. Chem. & Lab.5	CH	104	Fund. Chem. & Lab.5	BI	101	Prin. Biol.5
MH	160	Pre-Cal. w. Trig.5	MH	161	An. Geom. & Cal.5	CH	105	Fund. Chem. & Lab.5
EH	101	English Comp.3	EH	102	English Comp.3	EH	103	English Comp.3
HY	204	Tech. & Civliz.3	HY	205	Tech. & Civliz.3	HY	206	Tech. & Civliz.3

SOPHOMORE YEAR

BI	107	Environm. Biol.5	EC	200	Economics I.5	AM	304	Meteorology5
PS	205	Physics4	PS	206	Physics4	PS	207	Physics4
CH	203	Org. Chem.5	SC	202	App. Sp. Comm.3	RSY	362	Comm. Organiz.5
NF	112	Nutrition & Man3	CH	204	Anal. Chem. & Lab.5	BY	216	Intr. Bio. Comp.3

JUNIOR YEAR

PG	212	Psychology5	ZY	251	Physiology5	MT	344	Envir. Law4
ZY	250	Human Anat.5	EHA	304	Tech. Writing3	ADS	220	Anim. Biochem. or5
BY	300	Gen. Microbiol.5	PCS	563	Public Health5	NF	318	Nut. Biochem.5
AEC	210	Microcomputer App.3	PO	327	Policy Process5			Elective5
								Prof. Elective4

SENIOR YEAR											
BY	501	Bio. Statistics	5	BY	541	Environm. Microbiol.	5		Independent Study*	5	
IE	438	Safety Engr.	5	CE	524	Air Pollution	5	CE	527	Water Supply & Trmt.	5
		Prof. Elective	6			Prof. Elective	5	PY	537	Fund. of	
CE	520	Env. Engr. Chem. I	3	CE	521	Env. Engr. Chem. II	3			Bionucleonics	3
										Prof. Elective	6

TOTAL — 210 QUARTER HOURS

*An area of particular interest to the individual student can be selected for independent study, i.e. ADS 490, BY 460, CE 490, NF 408, PY 413, IE 490, etc.

Certificate in Aging Studies

The Certificate in Aging Studies is a multidisciplinary program designed for students interested in problems of aging persons which will give them a general competency in gerontology. The career-oriented option complements a student's major field of study and, upon completion of the 25 hours, lead to a Certificate in Aging Studies. The program is open to all students who choose to use their elective hours in this manner. Interested students should contact the academic advisers in their School and the School of Home Economics for further details concerning the program. The required courses (25 credit hours) and their prerequisites are as follows:

PG 302 Psych. Aspects of Death & Dying	3
*RSY 371 Applied Res. Meth. & Prog. Eval.	3
ZY 360 Physiology of Aging (Pr. BI 103)	3
FCD 477 Hum. Dev. V.: Family & Aging (Pr. FCD 270)	3
SY 477 Soc. of Aging (Pr. SY 201)	3
PG 507 Maturity & Aging (Pr. PG 212 or FCD 267)	5
FCD 497F Dir. Fid. Exp.: Aging (Pr. FCD 487)	
or	
Special Problems Course offered in student's major department (must incorporate Aging Studies in some way)	5

*RSY 370 (5), Methods of Social Research or a statistics or research course required by the student's major area may be substituted. Credit will not be given for both RSY 371 and RSY 370 or SY 370.

NOTE: There are interdepartmental curricula offered in Computer Science and Computer Engineering. See School of Engineering section, pages 149-150.

Graduate

Interdepartmental Programs

The Graduate School offers four interdepartmental programs which lead to the Doctor of Philosophy degree: Economics, Nutrition, Physiology, and Veterinary Medicine. Students in the interdepartmental Sociology program may earn the Master of Arts, Master of Science, or Master of Arts in College Teaching degree. Students in Nutrition and Physiology may also earn the Master of Science degree. These programs are supervised by coordinating committees appointed by the Dean of the Graduate School. Departments and schools cooperating in the Nutrition program are: Animal and Dairy Sciences, Fisheries and Allied Aquacultures, Nutrition and Foods, Poultry Science, and the School of Veterinary Medicine. The faculty and students in Physiology are drawn from the departments of Animal and Dairy Sciences, Chemistry, Health, Physical Education, and Recreation, Pharmacy, Physics, Poultry Science, Psychology, Veterinary Physiology and Pharmacology, Veterinary Anatomy and Histology, and Zoology-Entomology. The departments of Sociology and Anthropology and Agricultural Economics and Rural Sociology are the cooperating departments in Sociology.

Reserve Officers Training Corps

Department of Military Science

COLONEL WILLIAM A. LUTHER, JR.

Professor of Military Science and Commander

THE PURPOSE of the Army ROTC curriculum is to accomplish three functions. The initial courses serve to acquaint students with the Army and its role in our society. Concurrently, the overall program is designed to aid students in developing those habits and attitudes which will make them more academically successful and increase their chances of graduating with a better education and higher academic achievement. In addition, the program is designed to develop and provide well-educated junior officers for the Active Army as well as the Army National Guard and Army Reserve.

The curriculum is divided into two courses; a General Military Course open to all freshmen and sophomores and an Officer Development Course for qualified juniors, seniors and graduate students. Successful completion of both courses and award of a bachelor's degree constitute the normal progression to gaining a commission as a Second Lieutenant. Courses are available to both men and women students.

Students undecided about pursuing commissions may keep this option open by participating in the General Military Course together with their chosen curriculum. The course enables students to learn about the military profession and the role it plays in the democratic system of government. It also provides freshmen and sophomores the opportunity to make an educated decision on the advantages of gaining an officer's commission while incurring no military obligation. Successful completion of the General Military Course or commensurate training, a minimum 2.0 grade point average and medical qualifications are prerequisites for enrollment in the Officer Development Course.

The overall Army ROTC curriculum prepares students to become effective leaders and managers in a variety of responsible and challenging commissioned officer fields thus facilitating early middle management career development and progression. A description of the course requirements and associated programs is covered in the following paragraphs.

GENERAL MILITARY COURSE

Basic Program — The General Military Science electives enrich the freshman and sophomore students' courses of study and count toward their graduation requirements. Completing these courses also opens up an additional career option, enabling them to participate in advanced studies toward award of an officer's commission. Subsequently, they may gain either active service or service in the National Guard or Reserves while pursuing their civilian career choices.

The basic program consists of a six quarter block of instruction normally taken during the freshman and sophomore years. Eleven courses are available from which successful completion of any combination of six satisfies the academic requirements for progression to the Officer Development Course. General Military courses consist of a wide variety of military science courses at the 100 and 200 level.

These courses provide a foundation in basic military subjects as well as unique hands-on training in marksmanship and outdoor survival skills. These courses round out a student's academic life, provide a challenge, foster confidence and facilitate personal growth and development. Selected courses are offered Fall, Winter and Spring Quarters with one or two credit hours gained for each course. Elective credits earned apply toward degree requirements in all schools of the University. Freshman level courses normally meet one hour a week while sophomore level courses normally meet two hours each week. Students enrolled in any of the Basic Courses do not incur any military obligation, wear uniforms or participate in other military training. Students desiring to gain a broader perspective of military oriented training may also enroll in Leadership Laboratory, MS 306, which is an additional one hour class. The following 10 courses are available for Basic Program credit.

Curriculum In The General Military Course (MS I/MS II) (Basic Program)

MS 101 The U.S. Army Today	MS 139 /PE 139 Wilderness Skills
MS 102 Contemp. Military Issues	MS 162 /PE 162 Rifle Marksmanship
MS 103 Modern Military Weapons and Operations	MS 201 Military Power and National Security
MS 104 /PE 104 Mountaineering	MS 202 Map Reading & Troop Leading Procedures
MS 105 /PE 105 Pistol Marksmanship	MS 203 Leadership and Management
MS 133 /PE 133 Orienteering	MS 305 Ranger Operations*

* (Different Ranger Operations course is offered each quarter. Only one may be applied against satisfying the 314 course requirement for the Basic Course.)

Optional Basic Camp

Those academically qualified students who are unable to fulfill the requirements of the Basic Program during their freshman and sophomore years may qualify themselves for admission to the Officer Development Course by successfully completing basic camp preparatory training. This option provides a two year program in lieu of the standard four year curriculum.

The basic camp option consists of a six week training period conducted at an active Army post during the summer months. During 1985 six cycles will be available to meet student needs. Students desiring to exercise this option are required to submit a formal application and pass a general physical.

Students electing the basic camp training program will receive approximately \$600.00 in addition to travel expenses to and from the camp. Uniforms, housing, medical care and meals are furnished by the government during the camp.

Deadlines for applications are throughout the Spring Quarter. Interested students should contact the Military Science Department, Old Student Activities Building not later than the start of Spring Quarter 1985. A similar program will also be in effect in 1986.

OFFICER DEVELOPMENT COURSE

Advanced Program — The Advanced Program is designed to fully develop a candidate's leadership and management potential, physical stamina and poise, as well as those personal characteristics desired in an Army Officer. The program's objective is to produce the highest caliber junior officer fully capable of discharging a wide spectrum of command and management responsibilities in the modern Army and the business world.

The Officer Development Course consists of a six quarter block of instruction normally taken during the junior and senior years. Successful completion of six courses together with leadership laboratory each quarter fulfills military science academic requirements for award of an officer's commission. Three credit hours per quarter are earned in each of the courses. Students receive a subsistence allowance of \$100.00 a month (tax free) not to exceed \$1000.00 per academic year, while enrolled.

Service veterans, three or four year junior ROTC students, junior or military college transfers and former military academy cadets may qualify for direct entry into the Officer Development Course. Department evaluation of previous military training and academic achievement determines appropriate placement in the overall curriculum.

Advanced course students are eligible to participate in the Simultaneous Membership Program with the Army National Guard or Army Reserve. Students participating in this program affiliate with an Army unit as a student officer thus affording them the opportunity for enhanced leadership development. Students in this program receive an additional \$105.00 per month.

Students enrolled in the Officer Development Course are also required to complete successfully a six week Advanced Camp at Fort Riley, Kansas, during the summer to become eligible for commissioning. Attendance at Advanced Camp normally occurs in the summer between the junior and senior years. The purpose of Advanced Camp training is to provide each candidate hands-on experience in leadership development positions as well as extensive training in military tactics, techniques and related subjects vital to success as a junior officer. Students attending Advanced Camp receive approx-

imately \$825.00 in addition to travel expenses to and from Fort Riley. Uniforms, housing, medical care and meals are furnished by the government during the camp.

Additional voluntary training at one or more of a variety of active Army service schools is available to selected students during the summer. Students may select attendance at Ranger School, Airborne School, Air Assault School, The Northern Warfare Training Center and Cadet Troop Leadership Training. Students who successfully complete the appropriate course are authorized to wear the coveted Ranger Tab, Parachutist Badge, or Air Assault Badge.

Students who successfully complete the Army ROTC curriculum and who gain a bachelor's degree will be commissioned Second Lieutenants. Subsequent military service may be on active duty or with the Army National Guard or Army Reserve. Outstanding candidates who are selected as Distinguished Military Students may gain Regular Army commissions. Active duty is for a period of three years with the opportunity for quality officers to apply for extended service. Current salary for a married Second Lieutenant is \$19,422.00. Medical and other benefits are also provided at no cost. The following courses constitute the Advanced Program.

Curriculum In The Officer Development Course (MS III/IV) (Advanced Program)

MS 301 Land Navigation Techniques
MS 302 Military Training and Instruction Techniques
MS 303 Military Qualification Skills
MS 306 Leadership Laboratory*
MS 401 Military Justice and Ethics
MS 402 Advanced Leadership and Management I
MS 403 Advanced Military Leadership and Management II

*(Students take MS 306 each quarter in concert with one of the other advanced courses.)

Scholarship Programs

Each year the Army offers a variety of full scholarship programs to those young men and women who have demonstrated outstanding academic scholarship and leadership potential. Four year scholarships are awarded incoming freshmen through national merit competition. Three year and two year scholarships are available on either a national competitive basis or directly through the Professor of Military Science. Scholarships provide full tuition to both resident and out of state students, textbooks, materials and laboratory fees in addition to a \$100 a month tax free allowance. As opposed to nonscholarship candidates, scholarship students serve one additional year on active duty.

Army Nurse Corps Option

Students enrolled in the School of Nursing curriculum leading to the degree of Bachelor of Science in Nursing may simultaneously qualify for commissions as Second Lieutenants in the Army Nurse Corps.

Nursing students qualify for entry into the Officer Development Course through satisfactory completion of either the General Military Course, the Basic Camp option, or equivalent training.

Nursing students also participate in either the six week summer Advanced Camp training or an alternate Army nurse training program. The alternate advanced training is a voluntary six weeks program for nursing students at selected medical treatment facilities throughout the United States. It is structured to provide practical and leadership experience in the clinical setting. Primary focus is directed at providing nursing cadets an experience which integrates clinical interpersonal and leadership knowledge and skills. Emphasis is placed on practical experience under the direct supervision of an Army Nurse Corps Officer who acts as the cadet's preceptor throughout the camp period.

Army Aviation Flight Program

Several programs are available for cadets to become Army aviators. The first is a revolutionary new on-campus flight training program that will be offered beginning in the Fall 1985. Auburn has been selected as the only university in the United States authorized to conduct helicopter flight training for selected cadets. Qualified Army ROTC scholarship cadets enrolled in Aviation Management or Aerospace Engineering will be eligible to receive 60 hours of actual helicopter flight instruction during their senior year. Suc-

successful program graduates will be commissioned in the new Army Aviation branch and will complete their flight training at the Army Aviation School at Fort Rucker, Alabama.

The second opportunity is the Flight Training and Orientation Program conducted at Fort Rucker, Alabama each summer for 52 cadets from throughout the nation. Under this program selected students are able to attend four weeks of flight training of which 15 hours are actual flying experience. Ground training covers subjects such as basic aerodynamics, aircraft maintenance and tactical employment of helicopters. Successful completion of the program guarantees branching as an Army Aviator after commissioning.

Student Advisory Services — Faculty members are available throughout the academic year and during each summer orientation session in the Old Student Activities Building to all students for academic counseling, schedule planning and career guidance. Students and their parents are encouraged to seek advice on the overall Army ROTC program, scholarship opportunities and officer career development. Appointments may be made personally or by collect call to 205-826-4305.

Department of Naval Science

CAPTAIN WILLIAM H. COMPTON, USN

Commanding Officer and Professor of Naval Science

THE PURPOSE OF NROTC is to provide well-educated junior officers for the regular Navy and Marine Corps and to provide a reserve of trained officers for service in a national emergency. ALL NROTC programs are open to eligible women students.

TYPES OF NROTC STUDENTS

Students in the NROTC are of three types:

1. NROTC Navy-Marine Scholarship Program. Successful completion of this program leads to a commission in the regular Navy or Marine Corps and service at the pleasure of the President. The minimum active duty service is four years.

Tuition, fees, and textbooks for these students will be paid for by the Government. Students receive subsistence pay of \$100 per month for a maximum of 40 months. Active duty pay for summer training is approximately \$380 per month.

Although the Navy is emphasizing engineering and science majors, students, with some exceptions, may take most Auburn University majors leading to a baccalaureate degree. These will be considered on an individual basis by the Commanding Officer prior to appointment.

In addition to the requirements of their major, NROTC students are required to complete 29 quarter hours of Naval Science. Summer quarters are occupied with two at-sea training cruises and one summer period of career orientation, lasting from four to eight weeks each.

Entrance to the Navy-Marine Scholarship Program is effected through nation-wide competition. Applicants must make independent arrangements to take either the Scholastic Aptitude Test or the American College Test.

Scholarship students may resign without obligation at any time prior to the beginning of their second year in the Program.

2. Four-Year NROTC Navy-Marine College Program. These students may become commissioned officers in the Navy or Marine Corps Reserve. They are entitled to subsistence pay of \$100 per month for a maximum of 20 months during their final two years of NROTC training. They are required to serve on active duty for three years and retain their commission for a total of eight years from date of appointment, unless sooner released by the Secretary of the Navy. These students are selected by the Professor of Naval Science.

Students in the four-year program who have not yet received the \$100 per month subsistence payments may resign from the NROTC Program without obligation.

3. Two-Year NROTC Navy-Marine Scholarship Program. Selections for this program are made on a national basis from nominations submitted by the Professors of Naval Science. Selected applicants will attend a Naval Science Institute (NSI) for six weeks during the summer prior to their junior year. Successful completion of NSI will qualify these students for enrollment in the advanced course in the NROTC College Program.

Students in both the latter programs may apply for the Scholarship Program through national competition, or for Professor of Naval Science nomination for appointment as Scholarship students.

The student must complete all Naval Science requirements prior to or concurrently with receipt of a baccalaureate degree. Summer training consists of an at-sea training cruise between the junior and senior years.

Qualifications for enrollment, application blanks and information bulletins are available at high schools, colleges, recruiting stations, and the Auburn NROTC Unit.

Equipment

Uniforms, Naval Science textbooks, and equipment necessary to the NROTC Program are furnished in all programs.

Curriculum

Naval Science curriculum consists of the following hours per week: freshman and sophomore Naval Science courses and Marine Corps option courses, four hours; junior and senior Navy courses, five hours.

Naval Science subjects carried during the four-year curriculum are listed in the Description of Courses section of this Bulletin. Only the 300/400 series subjects are applicable to the Two-Year Program.

Freshman, sophomore, and Marine Corps option courses carry two quarter hours of credit. These hours of credit will be considered as a part of the normal quarterly load; however, Auburn University graduation requirements will be increased by 12 to 18 hours, depending upon the school in which enrolled, over the number of hours listed in the University catalog. Navy Option Scholarship students must also complete courses in calculus and physics.

Department of Air Force Aerospace Studies (AFROTC)

COLONEL RICHARD A. SANDERCOCK
Professor of Aerospace Studies and Commander

AFROTC is the nation's largest source of Air Force Officers. It provides a basic understanding of the role of air power and management of the Air Force. Enrollment in the General Military Course is open to all freshmen and sophomore men and women and does not require a military commitment. The Professional Officer Course (POC) is open to qualified men and women and leads directly to an Air Force commission.

General Military Course

Basic Course — The General Military Course is composed of one class hour and one Leadership Laboratory hour per week. One credit hour is allowed for each quarter of the six quarter basic course. Leadership Laboratory includes briefings by various Air Force commands and staff agencies and related corps projects. Students are provided the opportunity to visit various Air Force bases to acquaint them with operational Air Force units.

Professional Officer Course

Advanced Course — The Professional Officer Course consists of a six-quarter course normally taken during the junior and senior year. Enrollment in the advanced course is also open to graduate students if they have six-quarters of school remaining. Three classroom hours of instruction and one hour of Leadership Laboratory are taken per week. Three credit hours per quarter or a total of 18 credit hours are granted for completion of the Professional Officer Course; however, only six to 12 credit hours may be applied towards the total credits required for graduation. Students enrolled in the program are

given a monthly subsistence allowance and those selected for the pilot category are eligible for the Flight Instruction Program. Each student must successfully complete a course in mathematical reasoning prior to commissioning.

Field Training Course

Applicants for the Professional Officer Course attend a summer Field Training Course between their sophomore and junior years. The Air Force furnishes uniforms, housing, medical care, insurance, rations, a round trip travel allowance and military pay at field training. Students attend a four week course if they have completed the GMC or equivalent. If a student has no previous military training, a six week field training course is mandatory before POC entry.

College Scholarship Program

Four, three and one-half, three, two and one-half, and two year Air Force ROTC scholarships are available for male and female students who qualify. Scholarships provide full tuition, laboratory expenses and incidental fees, textbooks, \$100 a month allowance (tax free), and all uniform items. Scholarships are awarded to qualified students based on application to, and selection by central selection boards. Scholarship students must complete at least one quarter of foreign language and one quarter of English Composition.

Flight Instruction Program (FIP)

The Flight Instruction Program is conducted during the student's junior or senior year in AFROTC and provides the pilot category cadets with 13 hours of flight training. The primary purpose of this training is to determine a cadet's aptitude for flying and to motivate the cadet toward a career as an Air Force pilot. The Flight Training, provided by Auburn University is at no expense to the student and is conducted under a contract with the Air Force and monitored by the FAA.

Courses of Instruction

THIS SECTION lists and describes all courses taught by the departments of the University. The courses are presented by subjects, arranged alphabetically. The subject name (the heading in large type) is followed by the departmental symbol in parentheses. Below the subject appears a list of the departmental faculty.

The subject name (symbol) together with the course number constitutes the official designation for the course for purposes of registration and official records. The specific course title appears in boldface following the course number. The figures in parentheses denote the number of quarter hours of credit for the course. Following the credit hours are listed lecture and laboratory clock hours, if applicable. If none is listed, the course consists of lecture hours equal in number to course credit. Next appear the prerequisites, if applicable.

Courses are numbered according to the following system:

- 101-199** Courses primarily for freshmen.
- 201-299** Courses primarily for sophomores.
- 301-399** Courses primarily for juniors.
- 401-499** Courses primarily for seniors. Not open to graduate students.
- 501-599** Courses for advanced undergraduate and graduate students; and for fifth year students in professional curricula. **Junior Standing Required For Enrollment At This Level.**
- 601-799** Courses for graduate students.

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Note: COI Is Used For Consent Of Instructor In Course Description Headings.

University Courses (U)

The following courses, interdisciplinary and experimental in character, are designed to enable the student to see in a wide perspective the relationship of individual courses in his curriculum and to understand more fully the dominant ideas and concepts confronting him in the modern world. University Courses are open to students in all curricula.

105. **INTRODUCTION TO THE ARTS. (3).** An introduction to the processes involved in creating, understanding and appreciating the arts, including architecture, visual and plastic arts, dance, music and theatre. Administered by Department of Theatre.
190. **THEORY AND PRACTICUM IN COLLEGIATE SPORTS (1).** Conditioning activities in preparation for competitive football. Skills and fundamental techniques of physical activities related to football. Coaching techniques applicable to all areas of athletic competition. S-U graded.
201. **FORUM (1).** May be taken more than one quarter for a maximum of 3 credits. S-U only. Credit is given in recognition of significant attendance at public academic lectures, concerts, and other events. Requires attendance at seven of the 15-20 FORUM-designated events, which are chosen from various University lecture and concert series and departmental programs. Administered by Department of Political Science.
- 270-271-272. **ASCENT OF MAN (3). LEC. 2, LAB. 1.** Based on the films and text prepared by Jacob Bronowski, the course deals with the historic interaction between science and culture. Students view each week one film segment in the *Ascent of Man* series, with subsequent small-group classroom sessions devoted to discussion of the film and auxiliary readings.
275. **INTERPERSONAL RELATIONS (3).** A multi-disciplinary study of methods used by human beings in their interactions that tend to be mutually rewarding. Emphasis is on practical applications within the context of the student's present fields of study and projected fields of work.
305. **THE MODEL UNITED NATIONS (1).** May be taken more than one quarter for a maximum of 3 credits. S-U only. Preparation of materials for, and active participation in, the sessions of the Model United Nations program held annually on the campus. Administered by Department of Political Science.
399. **EXPERIENTIAL LEARNING (2-6).** Pr., sophomore standing and COI. May be repeated once for credit. A maximum of 6 credits allowed. Students may obtain academic credit for participation in learning experiences of a practical nature available outside the normal curricular offerings of the University. Normally S-U Graded.

Accounting and Finance (ACF)

Professors Edmonds, Hand, Lloyd, and Thorne

Associate Professors Rogow, Head, Alderman, Criss, Dinius, Fields,

McCord, Miley, Tole, and Worthington

Assistant Professors Beard, Burns, Jahera, Leichti, Page, Thompson, Waters, and Williams

Instructors Blumenfeld, Evans, Haygood, Johnson, Sayers, Schoff, and Zenor

ACCOUNTING

211. **PRINCIPLES OF ACCOUNTING I (4).** LEC. 3, LAB. 2. Pr., sophomore standing. Basic accounting principles, including the accounting cycle and preparation of financial statements. ACF 211 is not open to students with credit in ACF 215.
212. **PRINCIPLES OF ACCOUNTING II (4).** LEC. 3, LAB. 2. Pr., ACF 211. A continuation of accounting principles with emphasis on their application to partnerships, corporations, and preparation and analysis of various financial statements.
213. **MANAGERIAL COST AND BUDGETING (4).** LEC. 3, LAB. 2. Pr., ACF 212 and non-Accounting major. Introductory cost accounting and budgeting with some emphasis on distribution costs and managerial accounting problems.
215. **FUNDAMENTALS OF GENERAL AND COST ACCOUNTING (4).** LEC. 3, LAB. 2. Pr., sophomore standing. Fundamental concepts and principles of general and cost accounting. Emphasis on accumulating, reporting, and interpreting cost data in the production area of business operations. (Not open to undergraduates majoring in Business. Credit in ACF 211 precludes credit for ACF 215.)
311. **INTERMEDIATE ACCOUNTING I (5).** Pr., ACF 212 and junior standing. Accounting principles and theory, including a review of the accounting cycle and accounting for current assets, current liabilities, and investments.
312. **INTERMEDIATE ACCOUNTING II (5).** Pr., ACF 311. A continuation of accounting principles and theory with emphasis on accounting for fixed assets, intangibles, and corporate capital structure.
313. **INTERMEDIATE ACCOUNTING III (5).** Pr., ACF 312. A continuation of accounting principles and theory with emphasis on accounting for long-term liabilities and investments, pension costs, leases, analysis of financial statements and funds flow.
314. **INCOME TAX ACCOUNTING (5).** Pr., ACF 212. Interpretation of the regulations, preparation of returns, and the keeping of accounting records for tax purposes.
319. **BUSINESS LAW FOR ACCOUNTANTS (5).** Pr., ACF 312. Business law applied to the environment and applications of accountancy.
400. **STUDENT INTERNSHIP PROGRAM (1-10).** Pr., junior standing and selection by the committee directing the School of Business Intern Program.
410. **COST ACCOUNTING (5).** Pr., ACF 311 or COI and junior standing. Accounting principles and procedures involved in job-order, process, and standard cost accounting.
415. **BUSINESS INFORMATION AND ACCOUNTING SYSTEMS (5).** Pr., ACF 313 and senior standing. The design, installation, operation, and interrelationship of accounting systems which constitute the information flows and provide the basis for financial decisions in modern organizations.
416. **AUDITING I (5).** Pr., ACF 415 and senior standing. The principles of auditing with particular attention to methods of testing, analyzing, and summarizing accounting records.
470. **HONORS THESIS (1-6).** Pr., open only to persons in the University Honors Program and with consent of the student's Honors Adviser.
490. **SPECIAL PROBLEMS (1-10).** Pr., ACF 313 and senior standing. Advanced individual research and study of accounting and finance under guidance of a faculty member.
491. **VETERINARY BUSINESS METHODS (3).** LEC. 3, LAB. 1. Pr., 4th yr. Summer. Various aspects of business methods and legal concerns in starting a veterinary practice. Emphasis on accounting systems, record keeping procedures and taxation.
499. **SEMINAR IN CURRENT ACCOUNTING TOPICS (1).** Pr., graduating seniors. The current literature, problems, and controversies affecting the accounting profession.

ADVANCED UNDERGRADUATE AND GRADUATE

511. **FINANCIAL ACCOUNTING THEORY (5).** Pr., ACF 313. An evaluation, critique, and application of financial accounting theory to current reporting problems.
514. **ADVANCED INCOME TAX ACCOUNTING (5).** Pr., ACF 313, 314 and senior standing. Special tax accounting problems of individuals, partnerships, corporations, estates, and trusts. Extensive use will be made of a tax service program.
516. **AUDITING II (5).** Pr., ACF 416. An in-depth study of specialized auditing topics including statistical sampling and computer auditing.
517. **ADVANCED MANAGERIAL AND COST ACCOUNTING (5).** Pr., ACF 313, 410, and senior standing. Specialized managerial and cost accounting problems, including application of quantitative methods.

516. **BUSINESS COMBINATIONS AND OTHER PROBLEMS (5).** Pr., ACF 313 and senior standing. Accounting for business combinations, home and branch office procedures, partnerships, installment sales, consignment, receiverships.
519. **GOVERNMENTAL AND NON-PROFIT ACCOUNTING (5).** Pr., ACF 313 or ACF 313 concurrently and senior standing. Budgeting and accounting procedures of governmental divisions.
584. **SEMINAR IN TAX FACTORS IN MANAGEMENT DECISIONS (5).** Pr., MN 480, MN 480 concurrent or senior standing. Primarily non-technical. Study of tax consequences apt to attach to common business transactions.

GRADUATE

513. **FOUNDATIONS IN ACCOUNTING FOR MANAGEMENT (5).** Pr., MH 140 and, for non-business students, consent of Director of the MBA program, School of Business. An accelerated course in accounting fundamentals and business applications.
610. **MANAGERIAL ACCOUNTING (5).** Pr., ACF 513 or equivalent and, for non-business students, consent of Director of the MBA program, School of Business. For the MBA student confronted with business problems requiring a comprehensive understanding of accounting concepts, and accepted methods of applying these concepts in decision-making, planning, and control.
611. **ADVANCED ACCOUNTING THEORY (5).** Pr., ACF 313. A review of the origin and development of double-entry accounting; followed by a critical study of the theory of modern accounting principles and procedures.
614. **RESEARCH IN FEDERAL TAXATION (5).** Pr., ACF 514. Analysis of federal taxation problems and relationships among code provisions, generally accepted accounting principles, and business decisions.
615. **FINANCIAL INFORMATION SYSTEMS (5).** Pr., ACF 313 or COI. Identification, evaluation, and modification of critical information flows into efficient and effective information systems to service modern management decision needs.
616. **ADVANCED AUDITING (5).** Pr., ACF 416. Application of auditing principles and procedures to practical problems in public and private accounting.
617. **ADVANCED ACCOUNTING PROBLEMS (5).** Pr., ACF 611 or COI. An extension and a consolidation of all the other advanced accounting courses. Preparation for special accounting examinations.
618. **ADVANCED FINANCIAL REPORTING (5).** Pr., ACF 611 and ACF 616, or COI. An indepth study of current financial reporting problems and the resolution of such problems in accordance with professional standards relating to financial reporting.
621. **DEVELOPMENT OF ACCOUNTING THOUGHT (5).** Pr., ACF 313. The origin and development of accounting theories and concepts.
650. **SEMINAR (1-10).** Pr., COI. Intensive study and analysis of accounting and finance problems.
681. **DETERMINISTIC QUANTITATIVE METHODS IN ACCOUNTING (3).** Pr., MN 570 or equivalent and for non-business students, consent of Director of the MBA program, School of Business. Deterministic quantitative methods for business applications. (Same as MN 681.)
682. **STOCHASTIC QUANTITATIVE METHODS IN ACCOUNTING (3).** Pr., MN 570 or equivalent and for non-business students, consent of Director of the MBA program, School of Business. Various quantitative methods applied to decision-making under conditions of risk and uncertainty. (Same as MN 682.)
690. **SPECIAL PROBLEMS (1-15).** Pr., COI. Variable content in the accounting areas.
699. **RESEARCH AND THESIS.** (Credit to be arranged.)

FINANCE

320. **RISK AND INSURANCE (5).** Pr., ACF 361. Essentials of risk management, with the emphasis on the use of insurance in meeting these risks, including the characteristics of property, liability, life and health insurance.
323. **REAL ESTATE (5).** Pr., ACF 361. The fundamental principles and practices as applied to the purchase, sale, lease, mortgage, title, and management of real estate.
340. **PERSONAL FINANCE (5).** Pr., non-business student, junior standing. Plans for managing personal financial problems involving insurance, housing, household budgeting, investments, personal and bank loans, credit and time buying, etc.
361. **PRINCIPLES OF BUSINESS FINANCE (5).** Pr., EC 202, ACF 212, and junior standing. Short-term, intermediate and long-term financing of business firms.
363. **ADVANCED BUSINESS FINANCE (5).** Pr., ACF 361. A continuation of ACF 361 with emphasis on capital budgeting, cost of capital, growth, promotion, and reorganization.
367. **MONEY MARKETS AND FINANCIAL INSTITUTIONS (5).** Pr., ACF 361. Structure and operation of commercial banks and other financial institutions and their role in the financing of business.
400. **STUDENT INTERNSHIP PROGRAM (1-10).** Pr., junior standing and selection by the committee directing the School of Business Intern Program.
421. **PROPERTY INSURANCE (5).** Pr., ACF 320. The principles, uses and types of insurance with particular emphasis on fire, marine, automobile, and casualty lines.
422. **LIFE INSURANCE (5).** Pr., ACF 320. The organization of the life insurance business and the various types of contracts.

- 423. **REAL ESTATE FINANCE AND INVESTMENT (5).** Pr., ACF 323 or COI. Analysis and evaluation of real estate investments.
- 451. **MULTINATIONAL FINANCIAL MANAGEMENT (5).** Pr., ACF 361. The impact of various tax regulations, currency controls and exchange rates on the multinational firm.
- 463. **FINANCIAL MANAGEMENT: CASES AND COMPUTER APPLICATIONS (5).** Pr., ACF 311 and 363. The analysis of complex financial management cases with computers.
- 464. **INVESTMENTS (5).** Pr., ACF 361, junior standing, individual investment policies, investment institutions, and types of investments available.
- 466. **SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT (5).** Pr., ACF 311, 363 and 464. Analysis techniques and selection of securities to meet specific investment objectives.
- 469. **MANAGEMENT OF FINANCIAL INSTITUTIONS (5).** Pr., ACF 311, 361 and 367. Concentration on internal operations of financial institutions, especially banks.
- 470. **HONORS THESIS (1-6).** Pr., open only to persons in the University Honors Program and with consent of the student's Honors Adviser.
- 471. **UTILITY FINANCES (5).** Pr., ACF 311 or COI, and ACF 363. An in depth study of financial applications related to public utilities.
- 490. **SPECIAL PROBLEMS (1-10).** Pr., ACF 363 and senior standing. Advanced individual research and study in finance under guidance of a faculty member.

GRADUATE

- 561. **CONCEPTS OF MANAGERIAL FINANCE (5).** Pr., MH 140 and ACF 513 or equivalent and for non-business students, consent of the Director of the MBA program, School of Business. An accelerated course in finance and business applications.
- 620. **RISK MANAGEMENT IN THE BUSINESS ENTERPRISE (5).** Pr., EC 501 or equivalent or COI. An analysis of the appropriate methods used by business and other organizations to manage static risk.
- 650. **SEMINAR (1-10).** Pr., COI. Intensive study and analysis of accounting and finance problems.
- 651. **ADVANCED MULTINATIONAL FINANCIAL MANAGEMENT (5).** Pr., ACF 561 or equivalent and COI. Finance related problems and policies of the multinational firm; emphasizing taxes, accounting, exchange risk, and capital budgeting.
- 663. **ADVANCED CORPORATION FINANCE (5).** Pr., ACF 561 or equivalent and, for non-business students, consent of Director of the MBA program, School of Business. Intensive study of theory and problems of business finance from a decision-making, internal, problem-solving point of view.
- 665. **CASES IN FINANCIAL MANAGEMENT (5).** Pr., ACF 663. The application of formal analytical techniques to practical business situations requiring financial decisions through use of the case approach.
- 667. **ADVANCED CONSUMER CREDIT (5).** Pr., ACF 663. Consumer credit and its impact on financial institutions and the economy.
- 669. **ADVANCED FINANCIAL MARKETS AND INSTITUTIONS (5).** Pr., ACF 663. Financial institutions and markets and their impact on business decisions.
- 690. **SPECIAL PROBLEMS (1-15).** Pr., COI. Variable content in the finance areas.

Aerospace Engineering (AE)

Professors Williams, Head, Cochran, Cutchins, Martin, and Sforzini
Associate Professors Burkhalter, Foster, and Nichols
Assistant Professor Innocenti
Visiting Instructor Djordjevic

General Curriculum, GC, students (those with undeclared major) may enroll only with departmental consent.

- 203. **AEROSPACE FUNDAMENTALS (3).** LEC. 2, LAB. 3. Pr., MH 161. Aerospace concepts and terminology. General schemes and designs of aerospace systems and applications of computers to same. Duplicate credit will not be given for AE 203 and similar courses which include FORTRAN programming instruction.
- 300. **AEROSPACE ANALYSIS I (3).** Pr., MH 264. Special methods and notations used in Aerospace Engineering.
- 302. **AIRLOADS (4).** LEC. 3, LAB. 3. Pr., ME 340. Application of the basic equations of fluid dynamics to the prediction of pressure distribution, wing loading and hinge moments. Propeller design and selection.
- 303. **THEORETICAL AERODYNAMICS I (4).** Pr., ME 340 and AE 300. Fundamental analysis of aerodynamics, potential flow theory. Correlation of potential flow theory with experimental results.
- 304. **THEORETICAL AERODYNAMICS II (4).** LEC. 3, LAB. 3. Pr., AE 303. Fundamental principles of compressible flow including subsonic, transonic, supersonic, and hypersonic aerodynamics. High speed wind tunnels and laboratory techniques.
- 305. **FLIGHT PERFORMANCE (3).** Pr., AE 302. Equations of motion and solution techniques for vehicle performance analysis including effects of propulsion system and aerodynamic variations.

307. **AEROSPACE STRUCTURES I (5).** LEC. 4, LAB. 3. Pr., ME 207. Basic structural analysis. Shear and bending in monocoque structures. Deflections of beams and frames. Column and plate buckling. The laboratory portion is devoted to experimental techniques in stress analysis.
310. **AEROSPACE ANALYSIS II (4).** Pr., MH 265, ME 321. Linear and non-linear systems, linearization procedures, and linear systems analysis techniques. Other special techniques as required by advanced courses.
311. **AEROSPACE MATERIALS AND METHODS OF CONSTRUCTION (2).** PR., AE 307. Nomenclature, coding systems, physical and structural properties, applications and fabrication techniques as applied to aerospace materials.
326. **FUNDAMENTALS OF AEROSPACE DYNAMICS (3).** Pr., AE 310. Dynamics of aerospace vehicles in moving reference frames; Eulerian formulation for the vehicle as a rigid body; Lagrangian formulation and small oscillation theory. Provides a unified basis for further studies in aircraft vibration, flight dynamics, and space flight mechanics.
401. **AEROSPACE PROBLEMS (1).** LAB. 3. Pr., EHA 304 or COI, senior standing. Investigation of current aerospace problems; preparation and presentation of technical papers and reports.
409. **AEROSPACE STRUCTURES II (5).** LEC. 4, LAB. 3. Pr., AE 203 or equivalent knowledge of FORTRAN programming, AE 307, 310. A continuation of AE 307. An introduction to the finite element method. The laboratory portion is devoted to the solution of structural problems on the digital computer.
439. **STATIC STABILITY AND CONTROL (4).** LEC. 3, LAB. 3. Pr., AE 304. Introduction to static stability and control of flight vehicles including laboratory techniques for determination of stability parameters.
448. **AEROSPACE DESIGN I (1).** LAB. 3. Pr., senior standing. An application of the design process oriented toward the aerospace field with emphasis on the development of creative thinking and team effort. A two quarter sequence with AE 449.
449. **AEROSPACE DESIGN II (2).** LAB. 6. Pr., AE 448. A continuation of AE 448.
479. **HONORS THESIS (1-6).** Pr., COI and department head approval. Individual student endeavor consisting of directed research and writing of honors thesis. (AE Honors Program students only. May be repeated once for a maximum of 6 total credit hours.)
491. **SPECIAL PROBLEMS, (1-5 CREDIT HOURS TO BE ARRANGED).** Pr., departmental approval. Not open to graduate students.

ADVANCED UNDERGRADUATE AND GRADUATE

500. **VISCOUS AERODYNAMICS (4).** LEC. 3, LAB. 3. Pr., AE 304. Theoretical background essential to a fundamental understanding of laminar and turbulent boundary layers and their relations to skin friction and heat transfer. Experimental techniques.
501. **ADVANCED THREE-DIMENSIONAL AERODYNAMICS (3-5 CREDIT HOURS TO BE ARRANGED).** Pr., AE 304 and COI. Advanced concepts in the application of aerodynamic principles to finite wings and bodies, thickness effects, interference effects and computer simulation.
508. **INTRODUCTION TO COMPUTATIONAL FLUID DYNAMICS (5).** Pr., AE 500 or equivalent. An introduction to the application of modern numerical and computational techniques to problems arising in fluid dynamics. Emphasis will be placed on both solving practical problems and understanding the basic physical phenomenon involved.
514. **EQUILIBRIUM GAS DYNAMICS (3).** Pr., COI. Basic concepts of The Equilibrium Kinetic Theory and the equilibrium real gas properties. Aero-thermodynamic fundamentals of external flows for various atmospheric flight conditions in terms of flight speeds, altitudes and vehicle geometry.
515. **JET PROPULSION (5).** Pr., coreq., AE 304 Internal aerodynamics and thermodynamics of rockets and air-breathing jet engines. Jet nozzles. Detailed analysis of flow through turbojet compressors, combustors and turbines.
516. **ROCKET PROPULSION I (3).** Pr., AE 515. Detailed analysis of the thermodynamics, gasdynamics, and design of liquid-propellant rockets.
517. **ROCKET PROPULSION II (3).** Pr., AE 515. Design and performance analysis of solid-propellant rocket motors with emphasis on internal ballistics.
520. **DYNAMIC SIMULATION (3).** Pr., AE 326. Computer techniques applied to the analysis of aerospace engineering problems using analog and hybrid computers and the digital problem-oriented language. Advanced Continuous Simulation Language (ACSL).
521. **FLIGHT VEHICLE STRESS ANALYSIS (3).** Pr., AE 409. Stress analysis related to aircraft, missile, and space structures.
524. **NONEQUILIBRIUM GAS DYNAMICS (3).** Pr., COI. Nonequilibrium Kinetic Theory of real atmospheric gases. Applications of the thermal and chemical nonequilibrium conditions to the external flows for various flight conditions.
528. **SPACE PROPULSION SYSTEMS (5).** Pr., AE 515. Introduction to reaction engines for use in outer space vehicles. Power requirements for space missions, nuclear power systems, ion engines, magnetohydrodynamics and plasma accelerators, and photonic engines.
529. **AIRCRAFT VIBRATION AND FLUTTER (4).** Pr., AE 326, AE 409. Free, forced, and damped vibration of single and multiple degree-of-freedom systems; introduction to vibration of continuous systems; introduction to flutter theory; applications in aerospace.

532. **ASTRODYNAMICS I (3).** Pr., AE 326 or COI. Geometry of the solar system, detailed analysis of two-body dynamics and introduction to artificial satellite orbits; Hohmann transfer and patched conics for lunar and interplanetary trajectories. Elements of orbit determination.
533. **ASTRODYNAMICS II (3).** Pr., AE 532. Elements of general perturbation theory; n-body formulation and introduction to 3-body problem introduction to powered flight analysis and space flight guidance.
534. **AEROSPACE SYSTEMS ANALYSIS (3).** Pr., AE 310. Modeling of system elements, analysis of systems undergoing various motions connected with flight, and introduction to optimal linear control systems.
535. **ELEMENTS OF VISTOL FLIGHT (3).** Pr., AE 303 or COI. The analysis of methods for generating high lift at low vehicle forward speeds.
536. **ROTARY WING AERODYNAMICS (3).** Pr., AE 305. Aerodynamics and flight characteristics of the rotary wing aircraft.
541. **DYNAMIC STABILITY AND CONTROL (3).** Pr., AE 326, 439, 534. Derivation of the kinematic and dynamic equations used to describe the motions of aircraft. Analysis of the stability of steady state flight conditions. Response of aircraft to actuation of controls.
542. **AUTOMATIC STABILITY AND CONTROL (3).** Pr., AE 541. Principles and techniques of automatic control of aircraft and missiles. Effects on design variables.
543. **FLIGHT SIMULATION (3).** Pr., AE 541 and COI. Time domain simulation to the nonlinear six-degree-of-freedom motion of aircraft. Models for aerodynamics, propulsion and control systems. Special computer techniques applied to the generation of various flight profiles.
545. **MISSILE AERODYNAMICS (3).** Pr., AE 304, AE 439. The aerodynamics of slender wing-body configurations for the low supersonic, moderate hypersonic and Newtonian continuum flow regimes. Linear and non-linear effects are considered as well as interference effects. Application to missile performance and stability for certain flight profiles.

GRADUATE

601. **ADVANCED SUPERSONIC AERODYNAMICS (5).** Pr., AE 500. A rigorous development of linearized and non-linear fluid flow theories and application. Lifting surfaces, lifting bodies, duct flow, boundary layer effects, shock and expansion waves, and method of characteristics are considered.
602. **ADVANCED ELEMENTS OF HIGH SPEED AERODYNAMICS (5).** Pr., AE 601 or equivalent. A continuation of AE 601 to include three-dimensional wing theory; slender body theory and similarity laws for subsonic, supersonic and hypersonic flow conditions.
603. **HIGH-SPEED VISCOUS AERODYNAMICS (5).** Pr., AE 602 or equivalent. A continuation of AE 602 to include effects of conductivity and viscosity on aerodynamic properties.
604. **ADVANCED LOW SPEED AERODYNAMICS (3-5).** Pr., AE 300, 303. Theoretical analysis of two dimensional airfoils. Joukowski transformations, Theodorsen's theory and other techniques for determining flow characteristics over any two-dimensional airfoil. Finite wing analysis, lift distribution on finite wings.
605. **AEROELASTICITY (3-5).** Pr., AE 529. May be taken more than one quarter, not to exceed 10 hours. General formulation of aeroelastic problems, divergence, flutter and loss of control, dynamic stress, panel flutter.
608. **AEROSPACE STRUCTURAL DYNAMICS (3-5).** Pr., AE 529. Advanced theory of matrix structural analysis with applications to dynamics of flight.
609. **ADVANCED AERO-STRUCTURES (3).** Pr., AE 529. Vibrations of solids and wave propagation; introduction to general methodology and thermodynamics of solids; derivation of large-deflection equations, principles of basic solids investigations, and application to aerospace structures.
610. **ADVANCED VIBRATIONS PHENOMENA (3-5).** Pr., AE 529. Aerospace applications of dynamic phenomena measurement including linear varying differential transformers, piezoelectric accelerometers, dynamic force gages, and strain gages. On line use of hybrid and digital computers for data analysis and combined experimental simulation involving both experiment and computer. Use of various types of shakers in dynamic tests.
611. **THRUST GENERATION (5).** Pr., AE 515. Aerothermodynamics of compressible flow, chemical propellant characteristics, heat transfer in fluid flow, nuclear propulsion.
612. **AEROTHERMOCHEMISTRY OF PROPULSION (3-5).** Pr., AE 611 or COI. Selected topics emphasizing interrelation between internal aerodynamics and combustion phenomena in air-breathing jet engines and rockets. Various techniques of establishing equilibrium composition and flame temperatures; comparison of frozen and equilibrium flow in nozzles; effects of condensed phases; supersonic combustion.
613. **ADVANCED AIR-BREATHING PROPULSION (3-5).** Pr., AE 611 or COI. Selected topics emphasizing interaction between external aerodynamics and performance of air-breathing jet engines, boundary layer effects in diffusers and compressors, and detailed analysis of various techniques of minimizing detrimental effects, compressor and turbine matching in turbojets, cascade aerodynamics, and variable area jet nozzles.
615. **HYPERSONIC FLOW THEORY (3-5).** Pr., AE 500. May be taken more than one quarter, not to exceed 15 hours. Hypersonic continuum theory, governing equations of motion for two and three dimensional flows, hypersonic small disturbance theory, viscous effects. Real gas effects in gas dynamics and rarefied gas flows, basic heat transfer concepts.
616. **REAL GAS DYNAMICS (3-5).** Pr., COI. May be taken more than one quarter, not to exceed 15 hours. A microscopic approach to gas dynamics based on quantum mechanical models and statistical techniques.

617. **MOLECULAR THEORY OF AERODYNAMICS (3-5).** Pr., COI. May be taken more than one quarter, not to exceed 15 hours. Free molecular, near-free-molecular, and transition flows of neutral gases are considered. Basic equations are developed and selected geometries are treated in detail.
619. **DYNAMICS OF FLIGHT (5).** Pr., AE 541 or COI. Derivations of equations of motion for variable-mass and flexible flight vehicles; small-disturbance theory and the linearized solutions of the general equations of unsteady motions, aerodynamic derivatives, derivatives analysis, aerodynamic transfer functions, dynamic stability of uncontrolled longitudinal and lateral motions.
620. **FLIGHT DYNAMICS OF HYPERVELOCITY VEHICLES (3-5).** Pr., COI. May be taken more than one quarter, not to exceed 15 hours. Flight dynamics of steady and unsteady flight at hypersonic speeds, great-circle and minor-circle flight, re-entry, stability derivatives in hypersonic flow. Linearization of equations is investigated; static stability problems of hypervelocity vehicles are discussed.
624. **APPLIED NUMERICAL METHODS FOR AEROSPACE STRUCTURAL ANALYSIS I: STATIC STRUCTURES (5).** Pr., AE 409 or COI. Advanced techniques for the numerical solution of static elastic and plastic problems, including two-and-three-dimensional solutions. Analysis of problems with geometric and/or material non-linearities and including isotropic and anisotropic material properties. Evaluation of the effects of stress concentrations, thermal and cyclic loading.
625. **APPLIED NUMERICAL METHODS FOR AEROSPACE STRUCTURAL ANALYSIS II: STRUCTURAL DYNAMICS (5).** Pr., AE 624 or COI. Advanced techniques for numerical solutions to problems in structural dynamics, including steady state and transient response of two-and-three dimensional structures. Evaluation of vibratory stresses with regard to high cycle fatigue. Particular emphasis will be placed on the dynamic analysis of plate and shell structures.
632. **ADVANCED ASTRODYNAMICS (3-5).** Pr., AE 533 or COI. May be taken more than one quarter, not to exceed 15 hours. Selected topics from indirect and direct methods of trajectory optimization, trajectory isolation techniques, special and general perturbation theories, oblate earth problem, three body problem, space craft rotational motion, mission analysis methods, and new research developments.
633. **HELICOPTER DYNAMICS (3).** Pr., AE 536 or COI. Methods of analysis and design applicable to rotary-wing aircraft, theoretical basis for analysis of helicopter dynamics, stability and control.
640. **MAGNETO-GAS DYNAMICS (5).** Pr., COI. Review of electrodynamics. Maxwell stresses, field and momentum-energy tensors. Thermo-dynamics of fluids in electromagnetic fields. Equations of motion of a conducting gas. Discussion of typical flow problems. Consideration of microscopic aspects of plasma flows.
690. **SEMINAR. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter. Weekly lectures on current developments in aerospace sciences by staff members, graduate students, visiting scientists and engineers.
691. **DIRECTED READING IN AEROSPACE ENGINEERING (1-5).** May be taken more than one quarter.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Aerospace Studies (AF)

- 101-102-103. **THE AIR FORCE TODAY (1-1-1).** LEC. 1, LAB. 1. The organization and mission of the United States Air Force through study of major commands. An introduction to strategic offensive and defensive forces, general purpose forces, aerospace support forces, and the total force concept.
- 201-202-203. **THE DEVELOPMENT OF AIR POWER (1-1-1).** LEC. 1, LAB. 1. Air power from balloons and dirigibles through the jet age; a historical review of air power employment in military and non-military operations in support of national objectives; and a look at the evaluation of air power concepts, doctrine, and technological change.
- 301-302-303. **AIR FORCE MANAGEMENT AND LEADERSHIP (3-3-3).** LEC. 3, LAB. 1. Practical applications of military briefings and writing; study of basic management functions, problem analysis, motivation group dynamics, and leadership to provide fundamental skills for junior officers entering the active duty Air Force. The courses include seminars, guest lecturer, and experiential situations to develop officership.
- 401-402-403. **NATIONAL SECURITY FORCES IN CONTEMPORARY AMERICAN SOCIETY (3-3-3).** LEC. 3, LAB. 1. Focuses on Armed Forces as an instrument of national power and an integral element of society, emphasizes civilian-military relations and how U.S. defense policy is developed and implemented. Prepares students for transition to initial active duty.

Agricultural Economics and Rural Sociology (AEC) (RSY)

Professors Yeager, Head, Adrian, Bell, Clonts, Dunkelberger, Hardy, Martin, and Wilson
 Associate Professors Molnar and Stallings
 Assistant Professors Hatch, Jolly, Kinnucan, and Sullivan
 Instructor Cox
 Joint Appointee: Associate Professor Adams, Sociology

AGRICULTURAL ECONOMICS (AEC)

101. **INTRODUCTION TO AGRICULTURAL ECONOMICS (1).** Fields and scope of agricultural economics, growing importance, and significance of application of business principles to all phases of agriculture.

- 202. AGRICULTURAL ECONOMICS I (5).** All quarters. Economic principles with emphasis on farm-related production, marketing, prices, consumption, taxation, credit, finance, public policies and tenure. Treats utilization of land, labor, and capital. Credit not allowed in this course and EC 200.
- 206. AGRICULTURAL ECONOMICS II (5).** Pr., AEC 202 or equivalent. Continuation of economic principles with emphasis toward microeconomic concepts relating to farm firm. Credit not allowed in this course and EC 202.
- 210. MICROCOMPUTER APPLICATIONS IN AGRICULTURE (3).** LEC. 2, LAB. 2; Pr., 10 hrs MH. Introduction of microcomputer technology to increase understanding of use of computer decision aids in agricultural careers; hardware including microprocessor, display, keyboard, data storage and retrieval, printer and communication options; software including languages, electronic spreadsheet, word processing, data-based management, and programmed products; and interface with data source and processing systems.
- 301. AGRICULTURAL MARKETING (5).** Pr., AEC 202 or equivalent. Principles and problems in marketing farm products. Analysis of marketing functions, services, and costs; reducing costs and improving marketing efficiency. Marketing methods and distribution channels of major farm commodities. Market institutions and operation.
- 302. FARM RECORDS AND TAX MANAGEMENT (5).** Pr., AEC 202 or equivalent. Types and uses of farm records and accounts with emphasis on analyzing records to improve net farm income. Interpretation of income tax regulations and preparation of farm tax returns with emphasis on tax management.
- 303. AGRICULTURAL COOPERATIVES (3).** Pr., AEC 202. Principles and problems of organizing and operating farmers' cooperative buying and selling associations.
- 304. AGRICULTURAL FINANCE (5).** Pr., AEC 202. Economic problems and policies in financing agriculture.
- 305. FARM APPRAISAL (3).** Pr., AEC 202. Theory of land values; techniques on farm land and building appraisals for different purposes; relationships of land use, buildings, land titles, farm prices, taxes, and interest rates to land values; evaluation of appraisal methods and forms currently in use.
- 307. AGRICULTURAL LAW (5).** Legal environment of agriculture. Recognition of legal problems associated with property ownership, contracts, torts, financing, estate planning and environmental controls and restrictions.
- 399. AGRICULTURAL BUSINESS AND ECONOMICS INTERNSHIP (1-5).** S-U ONLY. (MAY BE TAKEN FOR TOTAL OF 10 HRS.) Pr., COI. To provide practical job experience under joint supervision of an employer and the department. Internships may be taken in a variety of agricultural business firms and agencies including finance, farm supply, production, marketing and sales, and government agencies. Training will prepare student for career employment.
- 490. SENIOR SEMINAR (1).** LEC. 1, Pr., senior standing. Pass-fail basis. Current developments in Agricultural Economics; the role of Agricultural Economics in the general economy.
- 499. DIRECTED STUDIES IN AGRICULTURAL ECONOMICS (1-5).** Pr., COI, junior standing. Individualized work and study in consultation with faculty member on subject of mutual concern. May include directed readings, research, analysis of an employment experience or a combination. Employment experience with a variety of agribusinesses and agencies may serve as the focus.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. FARM MANAGEMENT (5).** Pr., AEC 202 or equivalent. Principles of economics applied to agriculture, uses of farm records to improve management of the farm; developing enterprise budgets and use in preparing a profit-maximizing farm plan.
- 503. AGRICULTURAL PRICES (3).** Pr., AEC 202 or equivalent. Principles and factors in the pricing process with special reference to agricultural products and markets. Functions of prices and principles of supply and demand in price determination.
- 505. AGRICULTURAL POLICY (3).** Pr., AEC 202 or equivalent. Concepts, objectives and operation of public policies affecting agriculture. Development of agricultural policies in the United States.
- 509. RESOURCE ECONOMICS (5).** Pr., AEC 206 or COI. Principal economic and institutional factors affecting man and his use of land. Supply, demand, and future requirements for land. Property rights, land use planning, zoning, taxation and other social controls affecting land utilization.
- 510. AGRICULTURAL BUSINESS MANAGEMENT (3).** Pr., AEC 202 or equivalent. Principles and problems in acquiring, organizing and operating successful agricultural businesses, capital requirements, factors affecting location and growth, and measures of technical and economic efficiency in organization and operation; practices in buying, pricing, and merchandising, management problems and policies in financing, personnel, and public relations.
- 512. ECONOMIC ASPECTS OF WATER RESOURCES MANAGEMENT (5).** Supply, demand, and use of water resources including economic, legal, and political dimensions. Economics of management of water resource use and conservation in terms of present and future supplies and needs. Both public and private water resources will be considered.
- 520. ECONOMICS OF AQUACULTURE I (5).** Pr., AEC 202 or equivalent. Theory and application of economic principles of production, marketing, and consumption to aquaculture. Role of aquaculture in economic development with emphasis on international development.
- 521. PROJECT PLANNING AND SECTOR ANALYSIS (5).** Pr., AEC 520 or COI. Application of economic principles for optimum resource allocation and welfare to the unique problems of planning the long range development of lesser developed countries. Orientation of course is toward international aid programs.
- 530. WORLD AND U.S. AGRICULTURAL TRADE (5).** Pr., AEC 202 or equivalent. Theory and significance of international trade, world distribution of agricultural production and trade, important issues and policies, documentation, mechanics, and influence of exchange rates.

560. **INTRODUCTION TO ECONOMETRICS (3).** Pr., MH 161 or equivalent, MN 274 or equivalent, and AEC 202 or equivalent. Formulation of elementary economic models using economic theory and mathematics with certain basic assumptions or axioms. Mathematical tools used in economic analysis.

GRADUATE

601. **ADVANCED FARM MANAGEMENT (5).** Advanced theory and application of farm management principles and economic concepts in agriculture. Organization, operation, and management of various types of farms. Optimum utilization of available resources on individual farms.
602. **ADVANCED AGRICULTURAL PRICES (5).** Pr., MN 274 or equivalent. Methods of price analysis, separation of fluctuations from price trends, measurement of changes in supply and demand of farm products. Prices, price trends, price cycles, and other price structures.
603. **ADVANCED LAND ECONOMICS (5).** Man and his use of land as related to institutional factors. Economics of natural resource use, economic feasibility, benefit-cost analysis, economics of environmental control, and factors related to rural and urban land use.
604. **ADVANCED AGRICULTURAL FINANCE (3).** Pr., AEC 560, EC 603 or AEC 608, or COI. Basic theory and conceptual models including the capital asset pricing model and portfolio theory. Role of financial markets, financial intermediation and savings issues analyzed in a supply of funds context. Investment and valuation models will constitute the foundation of demand for funds analysis. Special issues including risk and finance in a developing country context.
605. **ADVANCED AGRICULTURAL MARKETING (5).** Theory of marketing with emphasis on its application to methods used and problems faced in marketing farm products. Objectives in agricultural marketing.
608. **ECONOMICS OF AGRICULTURAL PRODUCTION (5).** Pr., EC 551. Resource allocation and efficiency of production. Production and efficiency in the firm, between firms, and between agriculture and other industries. Influences on agricultural resource allocation and efficiency of risk and uncertainty.
609. **ECONOMICS OF AGRICULTURAL PRODUCTION II (3).** Pr., AEC 608 and AEC 610 or COI. Firm level economics problems are extended with emphasis on alternate models of the firm and techniques of analysis. Aggregate modeling of agricultural industry and production sector responses. Advantages, limitations, and appropriate interaction of firm level and aggregate production problems are studied and evaluated.
610. **QUANTITATIVE RESEARCH TECHNIQUES IN AGRICULTURAL ECONOMICS (5).** Introduction to basic quantitative techniques with emphasis on linear programming and its extensions. Concepts of input-output analysis, Markov chain analysis, dynamic programming, inventory control, queuing processes, replacement and game theory are also introduced. General theoretical background and associated computational procedures are used for presentation of each technique.
611. **ECONOMIC DEVELOPMENT (5).** Conceptual and empirical analysis of economic development with emphasis on the lesser developed areas and countries. Analysis of financial and technical aid to other countries and case studies of development problems will be incorporated.
616. **RESOURCE ECONOMICS, POLICIES AND PROGRAMS (5).** Impact of resource development on economic growth. Effect of taxation and tax policies. Interaction between technological change, resource use, and economic growth. Analysis of current policies and programs.
620. **DIRECTED READINGS IN REGIONAL PLANNING (5).** Assigned readings and pursuant discussions on delineation of economic areas, resource use and allocation, economic regions, watershed development, planning legislation, zoning, housing, land use restrictions, conservation, and recreation.
621. **REGIONAL PLANNING ANALYSIS (5).** Theories of regions and problems of multi-jurisdictional planning. Analysis of metro-area and regional planning by states. Comprehensive planning by agencies such as TVA, Corps of Engineers, and Appalachian Regional Commission. Regional planning and intergovernmental relations.
625. **ECONOMICS OF AQUACULTURE II (5).** Pr., AEC 520 or COI. Application of advanced economic theory and principles of production, marketing, and consumption to aquaculture. Analysis of comparative role and competitive position of aquaculture in economic development and resource allocation.
670. **RESEARCH METHODS IN AGRICULTURAL ECONOMICS (3).**
680. **SPECIAL PROBLEMS IN AGRICULTURAL ECONOMICS. (CREDIT TO BE ARRANGED.)**
690. **SEMINAR (1-1-1). FALL, WINTER, SPRING.**
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
799. **DOCTORAL RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

RURAL SOCIOLOGY (RSY)

281. **RURAL SOCIOLOGY (5).** Basic sociological concepts and principles as applied to life in the rural community. Special attention given to the culture, social organization, and social problems of rural people in the United States, and in the South in particular. Credit not allowed in this course and SY 201.
362. **COMMUNITY ORGANIZATION (5).** General elective. Understanding the principles of community organization and effective citizenship. Survey of institutions, organizations, and agencies interacting to meet community needs.
370. **METHODS OF SOCIAL RESEARCH (5).** Pr., RSY 261 or SY 201. Principal methods of data collection and analysis in sociological research.

371. **APPLIED RESEARCH METHODS AND PROGRAM EVALUATION (3).** Basic social science research techniques used in needs assessment studies and program evaluations. Fundamentals of social surveys, field experiments, demographic analyses and applications, principles, and strategies of evaluation. Credit not allowed in this course and in RSY or SY 370.
498. **DIRECTED FIELD EXPERIENCE (5).** Structured involvement in an agency or organization serving rural counties and/or small communities under joint supervision of agency personnel and university faculty. Regular faculty-student conferences to discuss, evaluate, and interpret experience.
499. **DIRECTED STUDIES IN RURAL SOCIOLOGY (1-5).** Pr., COI, junior standing. Individualized work and study in consultation with faculty member on subject of mutual concern. May include directed readings, research, analysis of an employment experience or a combination. May be used to complement and expand on an employment experience.

ADVANCED UNDERGRADUATE AND GRADUATE

541. **EXTENSION PROGRAMS AND METHODS (5).** An indepth consideration of extension orientation in adult and continuing education in U.S. and developing nations. The Cooperative Extension Service is analyzed as an educational institution. Fundamental steps in program development and evaluation.
561. **RURAL SOCIAL ORGANIZATION (5).** Pr., RSY 261 or SY 201. Nature of rural social organizations with emphasis on their structure, function and change. Extent to which organizations meet needs of rural people and principles of improving effectiveness.
562. **SOCIOLOGY OF COMMUNITY DEVELOPMENT (5).** Pr., RSY 261 or SY 201. Various approaches to development of human resources and planning of changes within the total community. Development in different types of communities in the U.S. and world is considered with emphasis on small population centers.
565. **SOCIOLOGY OF NATURAL RESOURCES AND THE ENVIRONMENT (5).** Overview of changing attitudes and institutional responses to the use and exploitation of natural resources. Conservation, preservation, and pollution control are treated as three primary sources of environmental concern. Global trends in population growth, energy availability, and environmental degradation are examined.

GRADUATE

661. **SOCIOLOGY OF REGIONS (3).** Social and demographic phenomena having implications for regional planning and development with emphasis on Southern region and subregions. Intra and inter-regional influences, socio-cultural structure, value orientations, population changes and trends, and metropolitanization.
662. **SOCIAL SYSTEMS AND COMMUNITIES (3).** Interrelationship of institutions and organizations within the community and to large societal systems — regional and national. Emphasis on small towns and metropolitan centers relative to planning community change.
670. **RESEARCH METHODS IN SOCIOLOGY (5).** Quantitative and qualitative procedures for obtaining social data using surveys, direct observation and secondary sources.
680. **SPECIAL PROBLEMS IN RURAL SOCIOLOGY. (CREDIT TO BE ARRANGED.)**
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**

Agricultural Engineering (AN)

Professors Turnquist, *Head* and Johnson
Associate Professors Flood, Hill, Koon, and Rochester
Assistant Professors Yoo and Fridley
Adjunct Professors Cooper, Gill, Shafer, and Taylor
Adjunct Associate Professors Bailey, Burt, and Hendrick

COURSES FOR ENGINEERS

101. **ORIENTATION TO AGRICULTURAL ENGINEERING (1).** LEC. 1, LAB. 2. S-U graded. Perspectives on the agricultural engineering profession, attaining professional status and the engineer's approach to problem solving. Emphasis on basic quantities used in physical systems.
201. **AGRICULTURAL ENGINEERING PRINCIPLES (5).** LEC. 4, LAB. 3. Pr., MH 161, CSE 200. Engineering concepts and principles applied to agricultural problems. Creativity and design. Unit operations of agricultural engineering.
311. **AGRICULTURAL MACHINERY & POWER UNITS (5).** LEC. 4, LAB. 3. Pr., AN 201, ME 301, ME 321, MH 265, CSE 200. Basic concepts and engineering analysis of principles of agricultural field machines, power units and tractors. To include mechanics of machines and tractors, stability, traction, efficiency, testing, safety and functional performance measurement.
313. **CONSERVATION AND WATER MANAGEMENT ENGINEERING (6).** LEC. 5, LAB. 3. Pr., AN 201, CE 310, CSE 200. Rainfall-runoff relationships. Soil erosion mechanics and control methods. Upstream flood control analysis and design. Soil-water-plant relationships. Theory and design of irrigation systems. Principles of agricultural drainage.
315. **AGRICULTURAL PROCESSING AND FOOD ENGINEERING (5).** LEC. 4, LAB. 3. Pr., AN 201, CE 310, ME 301. Design principles and equipment selection for crop, food and feed storage, preservation and manufacturing. Thermal processing, curing, drying, refrigeration, materials handling, pumps, fans and storage processes.

316. **ELECTRICAL SYSTEMS IN AGRICULTURE (5).** LEC. 4, LAB. 3. Pr., AN 201, EE 300, EE 330. Application of electrical power, equipment and control devices to agricultural systems. Special emphasis on safe and efficient power distribution, motor selection and performance, and theory and performance of sensing and control devices.
317. **ENVIRONMENT OF AGRICULTURAL STRUCTURES & WASTE MANAGEMENT (6).** LEC. 5, LAB. 3. Pr., AN 201, 315, CH 104, 104L, BI 101. Functional requirements and design of animal shelters and agricultural storage buildings. Emphasis on environmental control systems and energy management. Animal waste transport, processing and utilization systems. Biological treatment and processing systems with emphasis on utilization through refeeding and concurrent energy production systems.
401. **FOREST MACHINERY (3).** LEC. 3. Pr., AN 311, ME 316. Power requirements, design aspects, hydraulic systems, testing, rating and use of forest machinery. Vehicle-Terrain relationships. (Same as FYE 401.)
402. **FOREST ROADS DESIGN (3).** LEC. 2, LAB. 3. Pr., FY 304. Design, construction and maintenance of secondary and temporary road systems with an emphasis on preconstruction planning and design. Includes earth work calculations, drainage structures and erosion control. (Same as FYE 402.)
403. **AGRICULTURAL & FOREST STRUCTURES DESIGN (3).** LEC. 2, LAB. 3. Pr., ME 316. Analysis and design of structural systems of agriculture and forestry. (Same as FYE 403.)
420. **SEMINAR (1).** LEC. 1. S-U graded. Pr., upper division standing. Presentations, discussions, and reports relating to professional development.
430. **AGRICULTURAL & FOREST ENGINEERING DESIGN I (3).** LEC. 2, LAB. 3. Pr., ME 316, Senior Standing, COI. Design of equipment, structures, and systems for food, feed, fiber, forest products, and animal production utilizing engineering principles. (Same as FYE 430.)
479. **HONORS THESIS (1-6).** Pr., COI and department head's approval.
490. **SPECIAL TOPICS (2-5).** (CREDIT TO BE ARRANGED.) Pr., COI. May be taken more than one quarter for a maximum of 10 quarter hours. (Same as FYE 490.)

COURSES FOR NON-ENGINEERS

250. **WEATHER, CLIMATE AND AGRICULTURE (4).** LEC. 3, LAB. 3. An introduction to the elements of atmospheric science and how they combine to create variations in world climate. The relation of climate and climatic variation to agriculture with emphasis on the available sources of climatic information.
350. **SOIL AND WATER TECHNOLOGY (5).** LEC. 4, LAB. 3. Technical application of soil and water resources management. Irrigation system planning and equipment selection.
351. **AGRICULTURAL MACHINERY TECHNOLOGY (5).** LEC. 4, LAB. 2. Agricultural machinery: utilization, management, selection, and economic justification.
352. **TRACTOR AND ENGINE TECHNOLOGY (5).** LEC. 4, LAB. 2. Tractors and engines. Operation, fuels used, size selection, utilization, and economic justification.
353. **FARM BUILDINGS TECHNOLOGY (5).** LEC. 4, LAB. 3. Selection of materials, methods of construction and functional needs of modern farm building.
354. **AGRICULTURAL PROCESSING TECHNOLOGY (5).** LEC. 4, LAB. 3. Agricultural processing systems: includes storing, drying, pelleting, mixing and automatic materials handling systems.
355. **PRINCIPLES OF FOOD ENGINEERING TECHNOLOGY (5).** LEC. 4, LAB. 3. Pr., MH 161, PS 205. Engineering concepts and unit operations used in processing and handling of food products.
357. **ENVIRONMENTAL QUALITY AND AGRICULTURE (4).** LEC., 3, LAB. 3. Pr., CH 104. Basic introduction to pollution, measurement, nutrient cycles in nature, point and non-point source pollution, treatment and utilization of animal wastes and energy recovery from agricultural residues.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **AGRICULTURAL POWER AND MACHINERY DESIGN (3).** LEC. 2, LAB. 3. Pr., AN 311. Design of equipment and systems to apply engineering principles to solutions of agricultural power and machinery problems. Functional requirements, safety, reliability, service conditions, power measurement, useful life, and creative design are combined to obtain designs for agricultural machine and power units.
503. **SOIL AND WATER ENGINEERING II (3).** LEC. 2, LAB. 3. Pr., AN 313 or COI. Theory and design considerations of selected topics in irrigation, erosion, non-point source pollution, drainage or upstream flood control.
505. **ELECTRICAL AND PROCESSING SYSTEMS DESIGN (3).** LEC. 3. Pr., AN 315, 316. Design and layout of material handling systems, fundamental theory of particle movement, study of sensing and feed-back systems to include automatic controls and servo-mechanisms.
507. **AGRICULTURAL STRUCTURE DESIGN II (3).** LEC. 3. Pr., AN 317, 403. Functional requirements and design of animal shelters and agricultural storage buildings.
530. **AGRICULTURAL AND FOREST ENGINEERING DESIGN II (3).** LEC. 1, LAB. 6. Pr., ME 316, Senior or graduate standing, COI. Design of equipment, structures, and systems for agricultural and forestry situations utilizing engineering principles. (Same as FYE 530.)
590. **SPECIAL TOPICS. (CREDIT TO BE ARRANGED.) (2-5).** Pr., COI. May be taken more than one quarter for a maximum of 10 quarter hours. (Same as FYE 590.)
593. **PRACTICUM (1-5). MAY NOT EXCEED 10 HOURS CREDIT. NOT OPEN TO MAJORS IN AGRICULTURAL ENGINEERING.** Provides students with experience in Agricultural Engineering Technology closely relating theory and practice, usually carried on simultaneously.

GRADUATE

601. **ADVANCED SMALL WATERSHED HYDROLOGY (4).** Pr., AN 503, CE 512. Hydrograph synthesis. Mathematical modeling of runoff and streamflow. Probability analysis of hydraulic events. Design of upstream systems for flood and erosion control and water supply.
602. **ADVANCED FARM POWER AND MACHINERY (5).** Pr., AN 501 or COI. Principles of operation and analysis of design of basic machine elements, hydraulic systems and functional requirements of farm power units, agricultural machinery and materials of construction.
604. **AGRICULTURAL ENGINEERING PROBLEMS (CREDIT TO BE ARRANGED NOT TO EXCEED A TOTAL OF 5 HOURS.)** Special advanced engineering and design problems.
605. **SOIL DYNAMICS OF TILLAGE AND TRACTION (3).** Pr., CE 430 or AY 555 or COI. Analysis and measurements of soil reactions, as affected by the physical properties of the soil, when subjected to forces imposed by tillage implements and traction devices. Considered are shear, cohesion, adhesion, consolidation, plasticity and abrasion soil properties.
607. **ENGINEERING PRINCIPLES OF ANIMAL ENVIRONMENT (3).** LEC. 3. Pr., AN 507 or COI. Design and analysis of environmental equipment and systems for control or modification of animal production. Emphasis on evaluation of environmental factors which influence total environment.
608. **SEMINAR (CREDIT TO BE ARRANGED.)** Reviews and discussions of research techniques, current scientific literature and recent developments in agricultural engineering research.
610. **BIOLOGICAL AND PHYSICAL SYSTEM ANALYSIS I (3).** Pr., MH 362. Mathematical analysis and computer modeling of biological and physical systems including the formulation of differential equations with analytical and numerical solution techniques. Solutions by regression equations and by physical models. Decisions made under certainty, risk and uncertainty.
611. **BIOLOGICAL AND PHYSICAL SYSTEM ANALYSIS II (3).** Pr., AN 610. A continuation of AN 610.
690. **SPECIAL TOPICS. (CREDIT TO BE ARRANGED.) (2-5).** Pr., COI. May be taken more than one quarter for a maximum of 10 quarter hours. (Same as FYE 690.)
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **DOCTORAL RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Agronomy and Soils (AY)

Professors Guthrie, Head, Dickens, C. Evans, and Hajek,
Hiltbold, Hood, Johnson, and King

Associate Professors Dane, Odom, Touchton, and Walker
Assistant Professors Mosjidis, Pedersen, Weaver, and Wehtje

200. **CROP PRODUCTION (5).** LEC. 4, LAB. 2. Winter. Production of crops used by man for food, feed and fiber including identification of crop plants, cultural practices, and processing.
301. **PRINCIPLES OF GRAIN PRODUCTION (5).** LEC. 4, LAB. 2. Winter, Spring. Fundamental factors involved in the economic production of corn, small grains, grain sorghum, peanuts and soybeans.
304. **GENERAL SOILS (5).** LEC. 4, LAB. 2. Pr., CH 105 and 105L or CH 207 or CH 203. Winter, Spring. The formation, classification, composition, properties, management, fertility, and conservation of soils in relation to the growth of plants.
305. **GENERAL SOILS (5).** LEC. 4, LAB. 2. Pr., CH 103-104. Winter. The formation, classification, composition and properties of soils and their influence on vegetative growth and development on forest lands. Open only to students in Forestry.
307. **GENERAL SOILS (5).** LEC. 4, LAB. 2. Pr., CH 103-104. Fall, Spring. The general field of soils including genesis, classifications and fertility.
110. **EARTH SCIENCE (5).** Materials of the earth; forces that shape and sculpture the earth's surface, including weathering, water, soil formation and erosion; soil geography; and historical geology. (Not open to students in School of Agriculture and Agricultural Education. Credit toward degree may not be earned in both this course and a General Soils course.)
312. **PRINCIPLES OF WEED SCIENCE (5).** LEC. 4, LAB. 2. Pr., BI 102 and CH 104. Fall. Basic weed identification and biology, methods of weed management, and classification of herbicides and how they are used in weed control.
315. **TURFGRASS MANAGEMENT (5).** LEC. 3, LAB. 4. Pr., BY 102. Fall. The management of recreational and home area turfgrass will be studied and will include the establishment and maintenance of turf and the effect of light, traffic, soil fertility, and water on its growth.
321. **FATE OF PESTICIDES IN THE ENVIRONMENT (3).** LEC. 2, LAB. 3. Pr., BI 101-102, CH 207 or equivalent. Spring. Pesticide absorption, translocation by plants and effects on plant processes. Behavior of herbicides in soils and effects on soil microorganisms. Mechanisms of herbicide inactivation and the basis for herbicide selectivity.
390. **AGRONOMY AND SOILS INTERNSHIP (5).** Pr., COI, S-U graded. To provide the student with practical experience under the supervision of an approved employer and the department. Internship may be in the areas of production, business, turf or science.

399. **PROBLEMS IN WEED SCIENCE (1).** LEC. 1. Pr., COI. Fall. Conferences, problems, and assigned reading in weed science.
401. **PRINCIPLES OF FORAGE PRODUCTION (5).** LEC. 4, LAB. 2. Pr., junior standing. Fall, Spring, Summer. Grass and legume forage crops. The crops are considered from the standpoint of (a) pasture crops, (b) hay and silage crops, (c) soil improving crops.
403. **PESTICIDES (5).** LEC. 4, LAB. 3. Pr., CH 207. Winter. The chemistry, mode of action, activity, formulations, applications, and legal aspects of pesticides and pesticide applications.
404. **FIBER AND OIL CROPS (5).** LEC. 5. Pr., junior standing. Winter. Most of the time will be devoted to cotton, soybeans and peanuts with a limited amount of time devoted to other fiber and oil crops.
407. **CONCEPTS OF PEST MANAGEMENT (5).** LEC. 4, LAB. 3. Pr., COI. Spring. Pest management technology and philosophy.
420. **SOIL JUDGING (3).** LEC. 1 LAB. 4. Pr., AY 304, 305, or 307. Description, evaluation and interpretation of soil profile characteristics.
422. **FACTORS LIMITING CROP PRODUCTION (3).** LEC. 3. Winter. Factors influencing the production of crops including climate, water, soils. The role of plant and animal pests and the limitations created by the attitudes and mores of people.
490. **SENIOR SEMINAR (1).** LEC. 1. Pr., junior standing. Winter. S-U graded. Current developments and the role of crop and soil sciences.
499. **SPECIAL PROBLEMS (1-5) (CREDIT TO BE ARRANGED.)** Pr., departmental approval, junior standing. Not open to graduate students. Students will work under the direction of a staff member on special problems in crop, soil, or weed science.

ADVANCED UNDERGRADUATE AND GRADUATE

502. **SOIL FERTILITY (5).** LEC. 5. Pr., AY 304, 305 or 307. Spring. Lectures, demonstrations and problems illustrate principles of soil fertility as related to fertilizer practices and crop production. An advanced course, required of all students majoring in Agronomy and Soils. Either AY 502 or AY 507, but not both, may be used to satisfy the minimum requirement for the Master's degree.
506. **FERTILIZERS AND SOIL TESTING (5).** LEC. 4, LAB. 2. Pr., AY 304, 305 or 307. Winter. Manufacture and properties of fertilizer materials; properties and formulation of fertilizer mixtures; relative efficiency of various plant nutrient sources; principles and methods of soil testing and plant tissue testing.
507. **SOIL MANAGEMENT (5).** LEC. 5. Pr., AY 304, 305, or 307. Summer. Physical, chemical and biological properties of soils and their management. An advanced course designed for students in Agricultural Education. Either AY 502 or AY 507, but not both, may be used to satisfy the minimum requirement for the Master's degree.
508. **SOIL RESOURCES AND CONSERVATION (5).** LEC. 4, LAB. 2. Pr., AY 304, 305 or 307. Fall. Soils as a natural resource for land-use planning; their classification and management for crop production, recreation, and urban and industrial development.
509. **SEED PRODUCTION (3).** Pr., AY 201, or 401. Spring, odd years. Methods and factors affecting production, storage, and processing seed.
510. **METHODS OF PLANT BREEDING (5).** LEC. 4, LAB. 2. Pr., ZY 300. Fall, even years. A general course in the principles and methods of plant breeding.
514. **PRINCIPLES AND USE OF HERBICIDES IN CROP PRODUCTION (5).** LEC. 4, LAB. 2. Pr., CH 104. Fall. Principles and use of herbicides in agronomic crops. Acquaints the students with methods of application including equipment, time of application, methods of incorporation and formulation of herbicides. The fate of herbicides in soil and the ecological impact on succeeding plant species.
515. **SOIL MORPHOLOGY (5).** LEC. 3, LAB. 4. Pr., AY 304, 305 or 307. Spring. Physical, chemical and mineralogical properties of soils are studied in relation to their classification for engineering and agricultural uses.
516. **ADVANCED TURFGRASS MANAGEMENT (5).** Pr., AY 304, 315, BY 306. Fall, odd years. Factors affecting the grass plant as a component of a dynamic turf community. Influence of soil chemical and physical conditions, management practices and climate will be discussed. Both theoretical and practical aspects of turf cultural practices will be discussed along with design and construction of athletic turf areas.
517. **CROP QUALITY (5)** LEC. 5. Pr., AY 201, or 401. Spring. Quality of food, feed and fiber crops are regulated by genetic potentials, environment, management and utilization.
519. **SOIL INTERPRETATIONS FOR PLANNING (5).** Pr., COI. Characteristics that significantly affect soil response under various uses. (Not open to students in School of Agriculture or Agricultural Education.)
530. **SOIL CHEMISTRY (5).** LEC. 3, LAB. 4. Pr., AY 304, 305, or 307. Winter. An introduction to the basic soil chemical properties of mineral composition, weathering, absorption, ion exchange, acidity, alkalinity, salinity, and soil reactions with fertilizers, pesticides, and heavy metals.
555. **SOIL PHYSICS (5).** Pr., AY 304. Fall. Lectures and demonstrations to illustrate fundamental physical properties of soils.
593. **PRACTICUM (1-5). (MAY BE REPEATED NOT TO EXCEED 10 HOURS CREDIT.)** Not open to majors in Agronomy and Soils. Provides students with experience in Agronomy and Soils closely relating theory and practice, usually carried on simultaneously.

GRADUATE

601. **AGRONOMY PROBLEMS (1-5). (CREDIT TO BE ARRANGED.)** Conférences, problems, and assigned reading in soils and crops, including results of agronomic research from the substations and experiment fields.
606. **SOIL MICROBIOLOGY (5). LEC. 3, LAB. 4.** Pr., AY 502 and BY 300. Spring, odd years. Soil microorganisms and their physiological processes related to soil development and plant nutrition. The role of microorganisms affecting the chemical and physical properties of soils will be studied, with emphasis on the cyclical transformations of nitrogen, phosphorous, carbon, and sulfur.
608. **EXPERIMENTAL METHODS (5).** Fall. Experimentation in the agricultural sciences including experimental techniques, interpretation of research data, use of library references and preparation of publications; and consists of problems, assigned readings, and lectures.
615. **SEMINAR IN GENETICS (1).** Pr., ZY 300. Reports by students and staff members on current research and the literature in the field of genetics.
616. **ADVANCED PLANT BREEDING (5). LEC. 4, LAB. 2.** Pr., ZY 300. Winter, even years. Principles, methods, and techniques involved in plant breeding. Laboratory work will consist of studying active plant breeding programs, studying pollination techniques, and making pollinations. A term paper will be required.
617. **EXPERIMENTAL EVOLUTION (5).** Pr., ZY 300 and AY 616. Spring, even years. The factors affecting the evolution of species.
618. **CROP ECOLOGY (5).** Pr., BY 306 or ADS 204. Winter, even years. World population and food production problems. Origin, distribution and adaptation of crop plants as influenced by environment with emphasis on climatic and edaphic factors. Lectures and reading from current literature.
619. **ADVANCED FORAGE CROPS MANAGEMENT (5). LEC. 3, LAB. 4.** Pr., AY 401 and BY 306 or ADS 204. Winter, odd years. Principles involved in successful establishment, maintenance, and management of crops used for grazing, hay and silage. Several field trips will be made to research stations and private farms to observe management practices.
625. **CROP PHYSIOLOGY (5). LEC. 4, LAB. 2.** Pr., BY 306, CH 208. Winter, odd years. Principles of plant physiology as related to crop yield. Current crop physiological research discussed emphasizing methods of investigation and interpretation of results.
654. **PRINCIPLES OF PLANT NUTRITION (5).** Pr., AY 502. Spring, even years. Composition, properties and management of soils in relation to the nutrition and growth of plants.
655. **SOIL AND PLANT ANALYSIS (5). LEC. 2, LAB. 6.** Pr., CH 204 and AY 502. Winter. Principles, methods, and techniques of quantitative chemical analysis of soils and plants applicable to soil science.
656. **SOIL CLAY MINERALOGY (5). LEC. 4, LAB. 2.** Fall, even years. Crystal structure and properties of the important clay size minerals of soils and clay deposits combined with identification techniques involving X-ray diffraction and spectroscopy, differential thermal analysis, electron microscopy, specific surface analysis, and infrared absorption.
657. **SOIL PHYSICAL CHEMISTRY (5).** Pr., CH 507 and AY 530. Fall, odd years. Interpretation of soil properties and chemical reactions in terms of ion exchange, solubility diagrams, solution equilibria, electrochemistry, and electrokinetics of charged particles.
658. **ADVANCED SOIL PHYSICS (5).** Pr., MH 163, PS 205-206, and AY 555. Winter, even years. Transport phenomena in soils. Physical principles and analysis of the storage and movement of water, solutes, heat, and gases in soils.
690. **SEMINAR (1).** Fall and Winter. Required of all graduate students in Agronomy and Soils. May be repeated for credit.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** Research and thesis on problems related to crop production, plant breeding, soil fertility, soil chemistry, and soil physics.
799. **DOCTORAL RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Animal and Dairy Sciences (ADS)

Professors Topel, Head, Daron, Harris, Huffman, Kuhlert, Marple, McCaskey, Moss, Parks, Patterson, Smith, and Strength
Associate Professors Jones, Prince, Schmidt, and Thomas
Assistant Professors Bartol, Coleman, Cummins, Danielson, Mulvaney, Rahe, Russell, and Trout

110. **ORIENTATION TO ANIMAL AND DAIRY SCIENCE (1). LEC. 1.** Fall. An introduction to the departmental programs and personnel. Job opportunities for the individual trained in Animal Science.
200. **INTRODUCTORY ANIMAL & DAIRY SCIENCES (5). LEC. 4, LAB. 2.** Fall, Winter, Spring. The importance of livestock to agriculture and to the nutrition of people. Livestock terminology, selection, reproduction, nutrition, management, marketing and species characteristics of beef cattle, swine, sheep and horses.
202. **PRACTICAL LIVESTOCK MANAGEMENT TECHNIQUES. (2) LAB. 4.** Pr., ADS 200. Fall, Winter, Spring. Animal behavior patterns and skills such as castration, vaccination, dehorning, and implanting will be practiced by each student. Simple management techniques such as animal restraint procedures, and making of a rope halter will be emphasized.

205. **LIVESTOCK PROMOTION AND MERCHANDISING (2).** LAB. 6. Pr., ADS 200. Fall. Showing, fitting, public display, sales management, and advertising as it relates to the promotion and merchandising of cattle, swine and horses.
220. **ANIMAL BIOCHEMISTRY AND NUTRITION (5).** LEC. 5. Pr., CH 104. Fall, Winter. Principles of animal nutrition and biochemistry and a study of nutrients and their utilization by animals.
260. **GROWTH AND BODY COMPOSITION (4).** LEC. 2, LAB. 4. Fall, Winter. Prenatal and postnatal growth of muscle, fat, and bone of meat animals, the evaluation of body composition, quality, and yield grading; the pricing of live animals and their carcasses.
315. **HERD HEALTH MANAGEMENT (5).** Pr., BY 300 and ZY 316 or equivalent. Spring. Prevention and control of the major diseases of farm animals and development of herd health programs.
320. **FEEDS AND FEEDING (4).** LEC. 3, LAB. 2. Pr., ADS 220. Fall, Winter, Spring. Characteristics of feedstuffs and general comments about their processing. Principles and practices of balancing and compounding of rations for beef and dairy cattle, horses, sheep, swine and pets.
330. **LIVESTOCK EVALUATION AND MARKETING (3).** LEC. 1, LAB. 4. Pr., ADS 260. Winter. A comprehensive study of live animal and carcass evaluation techniques used in marketing and selecting beef cattle, swine and sheep.
331. **MEAT SELECTION AND GRADING (3).** LEC. 1, LAB. 4. Spring. The development of grading standards and application of federal grades to lamb, pork and beef carcasses, comparative evaluation of carcasses and wholesale cuts. Some labs in nearby processing plants.
333. **DAIRY CATTLE JUDGING (3).** LEC. 1, LAB. 4. Pr., ADS 200. Spring. Theory and practice in the selection of dairy cattle.
350. **ANIMAL BREEDING (5).** LEC. 4, LAB. 2. Pr., ZY 300. Fall, Winter. Application of population genetics to the improvement of cattle, sheep and swine. Studies of different systems of selection and mating and their related efficiencies for livestock improvement.
351. **LIVESTOCK SELECTION (4).** LEC. 2, LAB. 4. Pr., ADS 350. Spring. Theory and practice in the use of applied genetics principles, performance records and visual appraisal in the selection and breeding of beef cattle, dairy cattle and swine.
361. **REPRODUCTIVE PHYSIOLOGY (5).** LEC. 4, LAB. 2. Pr., ZY 316. Winter. Comparative anatomy, physiology, and endocrinology of animal reproduction and lactation: techniques involved in the artificial insemination and pregnancy testing of farm animals. Applications of these principles to improving the efficiency of livestock.
362. **ARTIFICIAL INSEMINATION OF FARM ANIMALS (2).** Spring. Techniques involved in artificial insemination and pregnancy testing of farm animals. Application of these techniques to reproductive systems of livestock.
370. **MEAT SCIENCE (5).** LEC. 4, LAB. 3. Winter, Spring. Fundamentals of slaughter, processing, storage and merchandising of meat and meat products. Biochemical and physiological implications of nutrition, breeding and antemortem treatment on meat quality, curing and processing.
380. **UNDERGRADUATE SEMINAR (1).** Pr., junior standing. Spring. Lectures and discussions on job opportunities by staff and guests.
392. **PRACTICUM (3).** Fall, Winter, Spring, Summer.
401. **BEEF PRODUCTION (5).** LEC. 4, LAB. 2. The course will be taught assuming students know background information taught in ADS 260, 320, 350 and 361. Winter. To provide an overview of the beef cattle industry. To develop modern concepts, ideas and methodology associated with the application of technology to the solution of problems related to reproduction, breeding, nutrition, management and use of facilities in a modern beef cattle industry.
403. **DAIRY CATTLE PRODUCTION (5).** LEC. 4, LAB. 2. The course will be taught assuming students know background information taught in ADS 260, 320, 350 and 361. Winter. Practical application and integration of nutrition, breeding, reproduction, selection, herd health, economics, and management for efficient dairy production.
405. **HORSE PRODUCTION (5).** LEC. 4, LAB. 2. The course will be taught assuming students know background information taught in ADS 260, 320, 350 and 361. Spring. Practical application and integration of nutrition, breeding, reproduction, selection, herd health, economics and management for efficient horse production.
407. **SWINE PRODUCTION (5).** LEC. 4, LAB. 2. The course will be taught assuming students know background information taught in ADS 260, 320, 350 and 361. Fall. Practical application and integration of nutrition, breeding, reproduction, selection, herd health, economics, and management for efficient swine production.
430. **ADVANCED LIVESTOCK JUDGING (3).** LEC. 1, LAB. 4. Pr., ADS 330, CDI. Spring. An advanced course in the principles and techniques of grading and selecting livestock based on visual evaluation.
431. **ADVANCED MEAT JUDGING (3).** Pr., ADS 331. Fall. Practice in evaluation and grading of beef, pork and lamb carcasses and cuts. Development of communication skills for the meat industry and exposure to animal agriculture through training in local meat packing plants and intercollegiate competition.
432. **ANIMAL EVALUATION AND MARKETING (3).** LEC. 1, LAB. 4. Pr., ADS 330. Winter. A comprehensive study of live slaughter animal and carcass evaluation techniques used in marketing cattle, sheep and swine.
433. **ADVANCED DAIRY CATTLE JUDGING (3).** LEC. 1, LAB. 4., ADS 333. Fall. Advanced course in the selection of dairy cattle.
477. **HONORS THESIS (3-6 Credits).** Repeatable once for a maximum of six hours credit.

490. **SPECIAL PROBLEMS (1-5).** (CREDIT TO BE ARRANGED.) Pr., departmental approval, senior standing. Fall, Winter, Spring, Summer. Not open to graduate students. Students will work under the direction of staff members on specific problems.
495. **INTERNSHIP IN ANIMAL AND DAIRY SCIENCE (5-15).** Pr., COI. S-U only. Fall, Winter, Spring, Summer.

ADVANCED UNDERGRADUATE AND GRADUATE

507. **ADVANCED SWINE MANAGEMENT (5).** Pr., ADS 407, junior standing, COI. Spring. Advanced course in the study of management techniques, facility design and operation of modern swine production systems.
508. **ADVANCED BEEF PRODUCTION (5).** LEC. 4, LAB. 2. Pr., ADS 260, 320, 401. Knowledge of ADS 520 and AEC 210 helpful. Spring, alternate years. Practical application and integration of nutrition, herd health, purchasing, marketing, economics and management of beef cattle in stocker and feedlot enterprises. Laboratories include animal handling feedlot management techniques and use of computers for decision-making and program analysis.
518. **BIOCHEMISTRY (5).** LEC. 4, LAB. 3. Pr., CH 208. Fall. Classification, structure, and chemistry of the major chemical constituents of living matter. (Same course as CH 518).
519. **BIOCHEMISTRY (5).** LEC. 4, LAB. 3. Pr., ADS 518 or equivalent. Winter, Spring. Introduction to metabolism. (Same course as CH 519.)
520. **ADVANCED ANIMAL NUTRITION (5).** LEC. 4, LAB. 2. Pr., ADS 320, CH 207. Winter. Nutrition of farm animals; the integration of animal physiology and nutrient metabolism with applied feeding practices used in animal production; discussion of recent nutritional developments.
560. **PHYSIOLOGY OF GROWTH (3).** Pr., ADS 520 or COI. Fall. Factors influencing growth and body composition: genetic, social environment, climate, growth regulators, metabolic rate and growth rates of muscle and adipose tissue; discussions of scientific journal articles.
565. **PHYSIOLOGY OF LACTATION (3).** LEC. 3. Pr., ADS 220 and ZY 316. Winter. The mammary gland, its structure and functions including uptake of precursors and the synthesis and secretion of milk.
570. **ADVANCED MEAT SCIENCE AND MUSCLE BIOLOGY (5).** LEC. 3, LAB. 4. Pr., ADS 370 or equivalent. Spring. Physiology and biochemistry of muscle and its conversion to meat; mechanism of muscle contraction; muscle microanatomy; antemortem and postmortem factors influencing fresh meat composition and quality.
577. **FOOD PLANT SANITATION (4).** LEC. 3, LAB. 2. Pr., BY 300 or COI. Winter. Sanitary regulation of food plants. Hazards in the food system and their elimination. Quality assurance.
593. **PRACTICUM (1-5).** (MAY BE REPEATED NOT TO EXCEED 10 HOURS CREDIT.) Not open to majors in Animal and Dairy Sciences. Provides students with experiences that closely relate theory and practice.

GRADUATE

(Graduate Standing Required)

620. **MINERAL METABOLISM (3).** LEC. 3. Pr., ADS 519, ZY 560 or COI. Spring (odd years). The function of minerals in animal metabolism including digestion, absorption, metabolic function, distribution, and excretion.
621. **ENERGY METABOLISM (3).** Pr., ADS 519, 520, ZY 560, or COI. Spring (even years). Energy utilization and heat production by animals as related to cellular biochemistry and physiology; factors affecting the digestion and metabolism of feed energy and its contribution to the total energy needs of animals. Interpretations of classical and current research.
622. **PROTEIN METABOLISM (3).** Pr., ADS 519, ZY 560 or COI. Fall (odd years). Nitrogen metabolism in ruminant and monogastric species. Amino acid utilization by the animal body.
623. **VITAMINS (3).** Pr., ADS 519, ZY 524 or ZY 560 or COI. Spring (even years). Chemistry, nutrition and function of the vitamins in metabolism.
625. **ADVANCED MONOGASTRIC NUTRITION (3).** LEC. 3. Pr., ADS 519 and ZY 560 or COI. Spring (even years). Digestion and absorption, nutrient utilization, requirements, and interrelationships in swine and other monogastric animals.
627. **ADVANCED RUMINANT NUTRITION (5).** Pr., ZY 560 and ADS 519 or COI. Spring (odd years). Rumen fermentation and the biochemistry of ruminant metabolism.
641. **PROTEINS (5).** Pr., ADS 519 or equivalent. Spring. Chemical and physical properties of amino acids and proteins, protein structures, and the reaction of protein structure to function. (Same course as CH 641).
642. **LIPIDS (5).** Pr., ADS 519 or equivalent. Fall. Chemistry of the lipids and their biological significance. (Same course as CH 642.)
643. **ENZYMES (5).** Pr., ADS 519 or equivalent. Winter. The principles of enzyme chemistry including the physical chemical and catalytic properties of enzymes; classification of enzymes; and enzyme formation. (Same course as CH 643.)
644. **TOPICS IN BIOCHEMISTRY (2-6 HRS. CREDIT — TO BE ARRANGED.)** Pr., ADS 519 or equivalent and COI. Fall, Winter, Spring. (Same course as CH 644.)
645. **BIOCHEMICAL RESEARCH TECHNIQUES (5).** Pr., ADS 519 or equivalent. Summer. Modern biochemical laboratory techniques.

646. **MICROBIAL BIOCHEMISTRY (5).** Pr., CH 519 or equivalent, BI 300 or equivalent. Fall. The anatomy, growth and metabolism of the bacterial cell with emphasis on the biochemical makeup of the cell and the regulation of its activities.
650. **EXPERIMENTAL METHODS (5).** Pr., BY 601. Spring (odd years). Research methods used in the animal sciences for the analysis and interpretation of data. Included are experimental designs, experimental techniques and evaluation of research projects.
651. **POPULATION GENETICS (5).** Pr., ZY 300 or equivalent, BY 601. Fall (odd years). Genetic composition, variation and factors that bring about change in populations.
652. **ADVANCED ANIMAL BREEDING (5).** Pr., ADS 651 and BY 601. Spring (even years). Statistical tools and methodology used in animal breeding theory and research. Criteria of selection, methods of selection, evaluation of breeds and application to the animal industry.
661. **ADVANCED REPRODUCTIVE PHYSIOLOGY (5).** Pr., ADS 361, ZY 524. Spring. Physiology and endocrinology of reproduction.
670. **MUSCLE PHYSIOLOGY AND BIOCHEMISTRY (3).** Pr., ADS 519, 560, 570 or COI. Winter. Biology of muscle growth and metabolism, the postmortem phenomena associated with the conversion of muscle to meat and evaluation of current literature.
680. **SEMINAR (1).** Pr., graduate standing. Fall, Winter, Spring. An intensive study of selected topics in some facet of animal sciences.
690. **SPECIAL PROBLEMS (1-5).** Fall, Winter, Spring, Summer. Conference problems, assigned reading, literature searches in one or more of the following major fields: (a) animal biochemistry and nutrition, (b) animal breeding and genetics, (c) dairy products, (d) meats, (e) microbiology and (f) physiology and physiology of reproduction.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** Fall, Winter, Spring, Summer. Research and thesis may be on technical laboratory problems or on problems directly related to beef and dairy cattle, sheep, swine or laboratory animals.
799. **DOCTORAL RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Anthropology (ANT)

For listing of courses, see page 362.

Architecture (AR)

Professors Blackwell, Davis, Doerstling, Drummond, Head, Faust, Gwin, Hing, Magyar, Meyer, Millman, and McPheeters

Associate Professors Burr, Cook (LOA), J. Lucas, Lundell, Robinson, Stewart, and Zorr

Assistant Professors Hubbs, Johnson, V. Lucas, Orgen, Reno, Shapiro, Weiss, Williamson

Adjunct Assistant Professors Gandy, McDonald, Pierce, and Rome

Visiting Instructors Braly, Fisher, McAlpine

ARCHITECTURE PROGRAM (AR)

- 101-102-103. **DESIGN FUNDAMENTALS (5-5-5) STUDIO.** 10-10-10. Pr., acceptance into AR, ID or LA Curriculum. Architectural drawing and basic rendering and communication techniques. Elemental design concepts employing two and three dimensional experiments and study of historic precedents.
121. **COMPUTERS IN ARCHITECTURE (3).** Introductory survey of existing and emerging techniques of computer utilization in architectural design, production, and management.
- 201-202-203. **ARCHITECTURAL DESIGN (5-5-5) LEC. 2-2-2, STUDIO.** 10-10-10. Pr., AR 101, 102 and AR 103. Man and his needs as the primary influence in shaping space, form, and function; approach to a design methodology and understanding of structure.
- 261-262-263. **HISTORY AND THEORY OF ARCHITECTURE (3-3-3).** Pr., 2nd year standing. The development of architecture from ancient times through contemporary examples. The cultural and social milieu, as well as the technology of each period will be investigated to better understand the basic determinants of architectural form. Composition of architectural space, will be considered. Illustrated lectures, readings, drawings, and reports.
- 301-302-303. **ARCHITECTURAL DESIGN (5-5-5). STUDIO.** 15-15-15. Pr., AR 203, AR 263, MH 161, PS 205. Analysis and solution of building design problems of moderate complexity; emphasis on environmental considerations and introduction of building systems.
320. **PHOTOGRAPHY I (3).** Pr., Open to AR, BSC, ID & LA only. COI. An exploration of the 35MM SLR camera in black and white photography for personal expression and as a tool for design.
321. **PHOTOGRAPHY II (3).** Pr., AR 320, COI. Development of individual photographic skills and insights into understanding of surroundings.
350. **20TH CENTURY ARCHITECTURE (3).** Pr., AR 263. Philosophical and theoretical architectural concerns of the twentieth century. Classroom format, readings, lectures, discussions and written reports.

360. **APPRECIATION OF ARCHITECTURE (3).** General elective. Pr., 2nd year standing. (Not open to AR, ID, and LA students.) Architectural development with particular attention to American and contemporary examples. Illustrated lectures, reading, essays.
370. **SPACES FOR LIVING (3).** General elective. Pr., 3rd year standing. (Not open to AR, ID, and LA students.) Contemporary concepts of design, spatial organization, materials, furnishing, and gardens in relation to all major types of residential architecture. Illustrated lectures, readings, reports.
401. **ARCHITECTURAL DESIGN (5). STUDIO. 15.** Pr., AR 303. Buildings of advanced complexity focusing attention on research, analysis and programming methodology; the building complex and urban design considerations.
402. **ARCHITECTURAL DESIGN (5). STUDIO. 15.** Pr., AR 401, BSC 315, 453. Studio exercises deal primarily with design problems on a community scale and are conceived to facilitate the application of principles and techniques introduced in the prerequisite planning courses.
403. **ARCHITECTURAL DESIGN (5). STUDIO. 15.** Pr., AR 402. Buildings of advance complexity focusing attention on research, analysis and programming methodology; the building complex and urban design considerations.
435. **PRESENTATION TECHNIQUES (3). LAB. 6.** Pr., 2nd year standing. Experience with graphic presentation of architectural subjects in various media with the objective of improving ability for more effective communication of design.
451. **SEMINARS IN METHODS AND PROCESS (3).** Explorations of the tools and techniques available to the design professional. Complete descriptions of specific seminars available from the department.
452. **SEMINARS IN CONTEMPORARY ISSUES (3).** Investigation of significant topics and issues that present opportunities and constraints to architectural thought and practice. Complete descriptions of specific seminars available from the department.
453. **SEMINARS IN INTERDISCIPLINARY STUDIES (3).** Various disciplines that impinge upon the design of buildings, including natural and social sciences, technology, and humanistic studies. Complete descriptions of specific seminars available from the department.
456. **SEMINARS IN HISTORICAL PERSPECTIVES (3).** Theories, schools, or periods with the intent of expanding awareness of critical attitudes toward both the potentials and limitations of architecture. Focus of individual seminars will range from ancient to post-modern architecture. Complete descriptions of specific seminars available from the department.
457. **SEMINARS IN ASPECTS OF DESIGN (3).** Detailed aspects of architectural design, such as form, space, style, meaning, imagery, or cultural context, with the intent of developing theoretical and analytical habits of thought. Complete descriptions of specific seminars available from the department.
458. **SEMINARS IN DISCIPLINES OF ENVIRONMENTAL DESIGN (3).** Related design fields to broaden appreciation of the range of concerns of the design professional. Complete descriptions of specific seminars available from the department.
- 465-466. **ARCHITECTURAL DESIGN (8-8). STUDIO. 16-16.** Pr., AR 403. Advanced problem solving processes and synthesis of previous design experiences; consideration of total scope of professional concerns, from architectural detailing to community design.
467. **ARCHITECTURAL THESIS (8). STUDIO. 16.** Pr. AR 466, 499. The extensive development of an architectural problem of the student's choice, under direction of the Committee on Design. Drawings, models, details, and written explanations, oral and/or published presentation for jury consideration.
469. **LIGHTING (3). LEC. 1, LAB 2.** Pr., 3rd year standing. An introduction to lighting, principles and techniques as applied to design in architecture and interior design.
- 471-472. **PROFESSIONAL PRACTICE (3-3).** Pr., 5th year standing. Procedure in architectural practice; construction methods, estimation of quantities and costs. Office organization; legal requirements; professional organizations and relations; civic responsibility, professional ethics.
474. **INTRODUCTION TO URBAN PLANNING (3).** Pr., 4th year standing, AR 263. A survey of urban planning history and theory; an examination of the basic forces, influences and practices shaping urban growth and development.
475. **URBAN DESIGN (3).** Pr., AR 474. Case studies seminar illustrating the building processes that shape cities and urbanize regions and the role of architectural and related design professions within these processes.
495. **SPECIAL PROBLEMS. (CREDIT TO BE ARRANGED UP TO 5 HRS.)** Pr., 3rd year standing. Development of an area of special interest through independent study. May be a group or team effort under direction of the faculty and with prior approval of the head of the Department. Evaluation of the work may be by faculty jury. May be taken more than one quarter. Maximum credit of 15 hours.
499. **DESIGN RESEARCH (2).** Pr., AR 465. The selection and comprehensive programming of a terminal problem in architecture to be executed in AR 467.

INTERIOR DESIGN (ID)

Courses specifically required in the Interior Design curriculum

215. **ELEMENTS OF INTERIOR DESIGN (3). LEC. 2, LAB 3.** Pr., AR 103. The profession of interior design including basic theory of interior design principles, aesthetics, and design concepts. Lectures, reading and discussions.
216. **ELEMENTS OF INTERIOR DESIGN (5). LEC. 2, LAB. 3.** Graphic drawing of interior spaces and related architectural design solutions. Lab projects involve development of delineation skills and techniques in graphic presentations.

217. **ELEMENTS OF INTERIOR DESIGN (5). LEC. 2, LAB. 3.** Basic drafting techniques and skills in relation to development of architectural working drawings required in the construction of interior spaces and equipment.
- 305-306-307. **INTERIOR DESIGN (5-5-5). STUDIO. 15-15-15.** Pr., AR 203. Admission upon recommendation of the Committee on Design. Analysis and solution of interiors of moderate complexity, with emphasis on domestic and commercial problems. Research, discussion, drawings, models.
- 365-366. **PERIOD INTERIORS (3). LEC. 3.** Pr., AR 261, 262, and 263. The development of interior spaces, furniture, fabrics, and accessories from pre-Renaissance to 1900. Illustrated lectures, readings, reports, and field trips.
367. **CONTEMPORARY INTERIORS (3). LEC. 3.** Pr., ID 368. The fundamental aspects of interior design, spatial order and characteristics, furniture and fabric design, from 1900 to date. Illustrated lecture, readings, reports.
- 405-406. **INTERIOR DESIGN (5-5). LEC. 2-2, STUDIO. 9-9.** Pr., ID 307. Admission upon recommendation of the Committee on Design. Analysis and solution of interiors of advanced complexity, with emphasis on institutional and public problems. Research, discussions, drawings, models.
407. **INTERIOR DESIGN (7). LEC. 2, LAB. 15.** Pr., ID 406. The development of a major design problem under the direction of the Committee on Design. Drawings, models, details; oral presentation for jury consideration.
408. **INTERIOR DESIGN RESEARCH (2). LEC. 1, LAB 3.** Coreq., ID 406. Selection and comprehensive programming of a terminal interior design problem to be executed in ID 407.
- 441-442. **PROFESSIONAL PRACTICE (3-3). LEC. 1, LAB. 3.** Office procedure and methods for interior designers; the techniques and execution of working drawings for buildings, cabinetry and interior details; specification. Discussions, drawings, inspections, reports.
495. **SPECIAL PROBLEMS. (CREDIT TO BE ARRANGED TO 5 HRS.)** Pr., 3rd year standing. Development of an area of special interest through independent study. May be a group or team effort under direction of the faculty and with prior approval of the department head. Evaluation of the work will be by faculty jury. May be taken more than one quarter. Maximum credit: 15 hours.

LANDSCAPE ARCHITECTURE (LA)

101. **SURVEY OF LANDSCAPE ARCHITECTURE (1). LEC. 1.** A lecture course for informing students about the Landscape Architecture profession. For non-Landscape Architecture majors.
231. **INTRODUCTION TO LANDSCAPE ARCHITECTURE (3).** Pr., 2nd year standing. A survey of the art and practice of landscape architecture; its aims, scope and philosophy.
232. **DEVELOPMENT OF LANDSCAPE ARCHITECTURE I (3).** Pr., 2nd year standing. An historical analysis of man's progress in designing land and outdoor space to meet varying needs in different times and places. Emphasis on religious, economic, cultural, social and political conditions, topography and climate as style determinants. Landscape design from ancient times to the first quarter of the nineteenth century. Lectures and collateral reading.
233. **DEVELOPMENT OF LANDSCAPE ARCHITECTURE II (3).** Pr., 2nd year standing. An historical analysis in continuation of AR 232 but may be taken separately. The impact of technological advance on the design of outdoor space. The shift from private to public works and the development of landscape architecture as an instrument of service in the public welfare. Lectures and collateral reading.
- 321-322-323. **BASIC LANDSCAPE ARCHITECTURAL DESIGN (5-5-5). LAB 15-15-15.** Pr., AR 203, BSC 324, HF 222, HF 223, HF 321. Introduction to the analysis and organization of the basic components of the landscape, including spatial elements of earth, plants and structure; design of simple outdoor spaces as they relate to the natural and cultural environment; introduction to principles of planting composition; coordination with courses in landscape construction.
341. **LANDSCAPE CONSTRUCTION I (5). LAB 15.** Pr., LA 321. Introduction to landscape construction with emphasis on interpretation of topography, problems in the development of land forms, and construction materials; simple site engineering.
342. **LANDSCAPE CONSTRUCTION II (5). LAB. 15.** Pr., LA 321. Advanced landscape construction and site engineering; preparation of working drawings, specifications and estimates. This course will run parallel to and may be combined with LA 322.
343. **LANDSCAPE CONSTRUCTION III (5). LAB. 15.** Pr., LA 321. A continuation of Advanced Landscape Construction and site engineering topics.
- 421-422-423. **INTERMEDIATE LANDSCAPE ARCHITECTURAL DESIGN (5-5-5). LAB 15-15-15.** Pr., LA 322, LA 342. A continuation of third year landscape architectural design concepts and principles with increasingly difficult problems involving the total range of the physical environment.
431. **ADVANCED PLANT COMPOSITION (5). LAB 15.** Pr., LA 421. A continuation of planting design incorporated in landscape design courses; emphasis on specific problems in respect to knowledge of plant characteristics and requirements in natural and man-made environments; preparation of planting plans and specifications.
446. **PROFESSIONAL PRACTICE I (5). LEC. 2, LAB 9.** Pr., LA 422, Coreq. LA 423. Procedure in landscape architectural practice; preparation of working drawings, specifications, and estimates.
447. **PROFESSIONAL PRACTICE II (5).** Pr., LA 446. Office organization, legal requirements, professional organizations and relations, civic responsibility, professional ethics.
450. **DESIGN RESEARCH (2).** Pr., LA 451. Directed studies and research involving the selection and comprehensive programming of a terminal problem in landscape architecture to be undertaken in LA 453.

451. **ADVANCED LANDSCAPE ARCHITECTURAL DESIGN (8-8).** LAB. 16-16. Pr., LA 423. Advanced problem solving processes and synthesis of previous design experiences with application to the environmental problems of today. Consideration of the total scope of professional concerns with emphasis on problems at a regional scale and the team approach to design with allied professionals.
- 452-453. **ADVANCED LANDSCAPE ARCHITECTURAL DESIGN (8).** LAB. 16. Pr., LA 450, LA 451. The extensive development of a problem which, by its relative comprehensiveness, will serve as a final examination for the professional degree of Bachelor of Landscape Architecture.
455. **SEMINAR IN LANDSCAPE ARCHITECTURE (5).** Pr., 5th year standing. A special experimental seminar or independent study course intended to cover topics not treated by regular course offerings.
495. **SPECIAL PROBLEMS IN LANDSCAPE ARCHITECTURE (3).** Pr., 3rd year standing. Development on a tutorial basis of an area of special interest through independent study. This may be a group or team effort under the direction of the faculty and with prior approval of the Head of the Department. Evaluation of the work shall be by faculty jury. May be taken more than one quarter.

COMMUNITY PLANNING

UNDERGRADUATE

514. **FINANCIAL ADMINISTRATION (5).** Pr., COI. Theory and practice of budgeting and the review of governmental financial documents. Same as PO 514.
520. **URBAN GEOGRAPHY (5).** The location, character, and growth of urban centers, with special attention to their interior patterns of land use and cultural development. Same as GY 520.

ADVANCED UNDERGRADUATE AND GRADUATE

522. **PLANNING AND ENVIRONMENTAL PERCEPTION (3).** Pr., COI. Analysis of human perception of the cultural, social and natural environments; the impacts of landscape alteration and their mitigation.
524. **REAL ESTATE DEVELOPMENT (5).** Pr., CP 474 or COI. Survey and analysis of the financial, legal, administrative, planning and design factors influencing the process of real estate development from the perspectives of developers, planners and consumers.
525. **HISTORIC PRESERVATION PLANNING (3).** Pr., COI. Planning for the preservation, restoration, conservation and adaptive reuse of historic buildings and sites within the comprehensive planning process.
527. **DOWNTOWN REVITALIZATION (3).** Pr., COI. Review and analysis of the goals, principles, strategies and programs for restoring and revitalizing the downtown areas with particular emphasis on physical building and reuse activities and their relationships to fiscal, administrative and private sector organization.
529. **PLANNING FOR RECREATION AND TOURISM (3).** Pr., COI. Basic concepts and methods of identifying and allocating recreation resources, the development of tourism and preparation and implementation of tourism and recreation plans and programs.
530. **COMMUNITY AND REGIONAL ENERGY PLANNING (5).** Pr., COI. Production and conservation of energy resources and the impact of energy development conservation and use; the role of energy planning in the comprehensive planning process, with policy formulation for energy planning at the community and regional scale.
535. **CURRENT PLANNING ISSUES (3).** Pr., COI. Seminar examining topical issues in the fields of urban and regional planning.
545. **RURAL AND COMMUNITY PLANNING (3).** Pr., COI. The nature of rural areas and communities, the perspective, responsibility and performance of the planning professional and a critical appraisal of regional and community plans.
564. **SITE PLANNING (5).** Pr., COI. Introduction to the art of site planning, an exposition of its principles and application of its techniques with both large and small scale projects.
574. **INTRODUCTION TO URBAN PLANNING (3).** Pr., COI. A survey of planning history and theory; an examination of the basic forces, influences and planning practices shaping growth, development and revitalization of cities. Credit not allowed for both CP 574 and AR 474.
575. **URBAN DESIGN (3).** Pr., COI. Illustration of the building processes that shape cities and urban regions; the three-dimensional form and character of cities and the role of the planner and environmental design professional within these processes. Credit not allowed for CP 575 and AR 475.
596. **SPECIAL PROBLEMS IN PLANNING (1-5).** Pr., CP 474 and COI. Directed study in an area of special interest. Topic and credit to be arranged with advisor and approved by the chairman. May be repeated for a maximum of up to 10 quarter hours credit.

GRADUATE

601. **HISTORY AND THEORY OF PLANNING (5).** Historical development of cities and regions, with particular emphasis on the interaction of their dynamic and structural elements; impact of the planning process and planner on public policy and private decision-making; responsibility and professional planning practice.
- 602-603-604-605. **PLANNING STUDIO (5-5-5-5).** Pr., COI. Use of the comprehensive planning process in individual and team activities to assist a client community, agency, or organization in the solution of a community, county, or regional planning problem under faculty direction in cooperation with other professionals, public agencies, and jurisdictions.

635. **PLANNING RESEARCH (5).** Pr., COI. Introduction to methods useful in the comprehensive planning process, including population projections, migration, economic base, resource allocation, interrelationships between population and facilities/services needs, and the use of land.
636. **SEMINAR IN POLICY AND ADMINISTRATION (5).** Formation, execution and evaluation of public policy, plus in depth analysis of selected policy areas. Same as PO 636.
640. **PLANNING LAW (5).** Pr., COI. The legal base for local government, planning for and guiding development and conservation of land and other resources, including police powers and eminent domain, zoning, subdivision regulations, permit systems and administrative review, health laws and housing and construction codes.
698. **PLANNING SYNTHESIS (5).** Pr., COI following satisfactory completion of oral examination. Demonstration of planning competence by the production of an original work in planning to include integration of knowledge from previous courses and experience in a proposed solution to a complex planning problem or project. The emphasis will link the student's area of specialization and the comprehensive planning process.

Art (AT)

Professors Hiers, *Head*, Abney, Hatfield, Olson, Ross, Taugner, and Williams
Associate Professors Collier, Dugas, Hartsfield, Hobbs, Munday, and Price
Assistant Professors Andrews, Bogard, Caruthers, Dendy, Furr, Markle,
Morgan, and Wagoner
Instructor Mitchell

All studio courses require 10 hrs. contact with instructor and 5 hrs. of independent work.

111. **FUNDAMENTALS (5). STUDIO 15.** Mechanical linear perspective.
112. **FUNDAMENTALS (5). STUDIO 15.** Representational drawing. Linear construction, proportion, freehand perspective, chiaroscuro, surface treatments.
113. **FUNDAMENTALS (5). STUDIO 15.** Pr., AT 111, 112. Interpretive drawing. Emphasis on creativity, composition and pictorial organization.
121. **FUNDAMENTALS (5). STUDIO 15.** Plastic elements. Relationship of the arts. Problems in basic design.
122. **FUNDAMENTALS (5). STUDIO 15.** Basic three-dimensional organization. Clay and other media.
123. **FUNDAMENTALS (5). STUDIO 15.** Pr., AT 121, 122. Advanced application of principles encountered in AT 121 and AT 122.
171. **HISTORY OF WORLD ART (3). LEC. 3.** A survey of the major movements and developments of Western art history from Paleolithic art through the Gothic age.
172. **HISTORY OF WORLD ART (3). LEC. 3.** A survey of Western art history from the Renaissance through Realism.
173. **HISTORY OF WORLD ART (3). LEC. 3.** A survey of Western art history, art, and artists from Impressionism through contemporary art.
211. **BASIC FIGURE DRAWING (5). STUDIO 15.** Pr., AT 113, 121, 122, 171, 172, 173. Open to VAT majors only. Drawing in various media emphasizing a subjective approach to the human figure as form and as a compositional element. Live nude models will be utilized on occasion.
212. **FIGURE CONSTRUCTION (5). STUDIO 15.** Pr., AT 113, 121, 122, 171, 172, 173. Open to VAT majors only. Lectures deal with form, function and operation of skeletal and muscular parts of the body. Drawing from casts, skeleton, and, occasionally, from the live nude model.
213. **FIGURE DRAWING (5). STUDIO 15.** Pr., AT 123, 211, 212. Open to VAT majors only. Drawing from the model in various media, with emphasis on construction, interpretation, and expression. Live nude models will be utilized on occasion.
221. **GRAPHIC PROCESSES (5). STUDIO 15.** Pr., AT 111, 112, 123, 171, 172, 173. Open to VAT majors only. Graphic reproduction processes, preparation of art copy for reproduction, copy fitting, paper, related subjects.
222. **DESIGN SYSTEMS (5). STUDIO 15.** Pr., AT 111, 112, 123, 171, 172, 173. Design procedures for creative problem solving in areas of visual organization; emphasis on presentation and visualization of concepts.
223. **GRAPHIC FORMATS (5). STUDIO 15.** Pr., AT 113, 221. Applied problems in editorial and advertising layout. Emphasis on relationship of format to media.
- 231-331. **OIL PAINTING (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 232-332. **TRANSPARENT WATER COLOR (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 233-333. **OPAQUE WATER COLOR (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 241-341. **RELIEF PRINTMAKING (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 242-342. **INTAGLIO PRINTMAKING (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 243-343. **PLANOGRAPHIC PRINTMAKING (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 251-351. **CLAY SCULPTURE (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.

- 252-352. **WOOD SCULPTURE (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 253-353. **STONE SCULPTURE (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
301. **ELEMENTARY SCHOOL ART (5). LEC. 2, LAB. 8.** Pr., junior standing. Cannot be taken for credit by VAT majors. An introduction to design principles and elements. The theory of teaching art, methods and materials especially related to elementary school art.
321. **PHOTODESIGN (5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173. Open to VAT majors only. Technical aspects of equipment, materials and processing. Emphasis on aesthetic analysis. Historical development of photography as related to visual communications. Some special expense required.
322. **PHOTOCOMMUNICATION (5). STUDIO 15.** Pr., AT 221, 321. Photography as applied communication. Emphasis on advanced technical and studio techniques.
323. **TYPOGRAPHICS (5). STUDIO 15.** Pr., AT 221. Practical applications of typography in advertising, editorial, and other contemporary formats. Historical and anatomical development of type and letterforms.
371. **ANCIENT ART (3). LEC. 3.** Pr., sophomore standing.
372. **MEDIEVAL ART (3). LEC. 3.** Pr., sophomore standing.
373. **RENAISSANCE ART (3). LEC. 3.** Pr., sophomore standing.
374. **BAROQUE AND ROCOCO ART (3). LEC. 3.** Pr., sophomore standing.
375. **EARLY MODERN ART (3). LEC. 3.** Pr., sophomore standing.
376. **TWENTIETH CENTURY ART (3). LEC. 3.** Pr., sophomore standing.
377. **PRE-COLUMBIAN ART (3). LEC. 3.** Pr., sophomore standing.
378. **EARLY NETHERLANDISH PAINTING (3). LEC. 3.** Pr., sophomore standing.
379. **THE ARTS OF JAPAN (3). LEC. 3.** Pr., sophomore standing.
- 424-425-426. **VISUAL DESIGN I-II-III (5-5-5). STUDIO 15.** Pr., AT 213, 222, 223, completion of 18 hours of art history, junior standing and taken in sequence. Open to VAT majors only. The application of communicative procedures and skills necessary to convey messages by means of graphic presentation: an indepth study of problem solving. Development of student's individual style and main potential.
- 434-435-436. **ADVANCED PAINTING/DRAWING I-II-III (5-5-5) STUDIO 15.** Pr., AT 213, 231, 232, 233, completion of 18 hours of art history, junior standing and taken in sequence. Open to VAT majors only. Advanced painting with medium and subject idea determined by instructor in consultation with the student. Emphases in these courses are the strengthening of the student's aesthetic awareness and technical skills as a maturing painter.
- 444-445-446. **ADVANCED PRINTMAKING I-II-III (5-5-5). STUDIO 15.** Pr., AT 213, 241, 242, 243, completion of 18 hours of art history, junior standing and taken in sequence. Open to VAT majors only. Advanced printmaking with medium and subject idea determined by instructor in consultation with the student. Emphases in these courses are the strengthening of the student's aesthetic awareness and technical skills as a maturing printmaker.
- 454-455-456. **ADVANCED SCULPTURE I-II-III (5-5-5). STUDIO 15.** Pr., AT 213, 251, 252, 253, completion of 18 hours of art history, junior standing and taken in sequence. Open to VAT majors only. Advanced sculpture with medium and subject idea determined by instructor in consultation with the student. Emphases in these courses are the strengthening of the student's aesthetic awareness and technical skills as a maturing sculptor.
- 464-465-466. **ILLUSTRATION I-II-III (5-5-5). STUDIO 15.** Pr., AT 213, 223, completion of 18 hours of art history, junior standing and taken in sequence. Open to VAT majors only. Application of illustrative concepts, media and techniques to various graphic formats. Development of personal skills and an individual style.
499. **TERMINAL PROJECT IN ADVANCED STUDIO (5).** Pr., completion of Group B Studio in area of concentration and must be taken during the students final quarter. A directed terminal studio project with students choice of subject and medium. The project will be exhibited and a committee will award a letter grade. Professional quality color slides of the project work must be presented to the Art Department before the student is cleared for graduation.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **ART IN EDUCATION (5). LEC. 2, LAB. 8.** Pr., senior standing. Cannot be taken for credit by VAT majors. Lectures, reading and research concerning principles and objectives of pertinent phases of Art for the purpose of understanding their significance in teaching at all levels. Emphasis is placed upon creativity rather than technical skill in laboratory experimentation.
520. **INDEPENDENT STUDY IN ADVANCED DESIGN (5).** Pr., 3.0 minimum average in AT 424, 425 and 426, senior standing. Open to students who have shown ability, initiative, and industry on individual projects.
530. **INDEPENDENT STUDY IN ADVANCED PAINTING (5).** Pr., 3.0 minimum average in AT 434, 435 and 436, senior standing. Open to students who have shown ability, initiative, and industry on individual projects.
540. **INDEPENDENT STUDY IN ADVANCED PRINTMAKING (5).** Pr., 3.0 minimum average in AT 444, 445 and 446, senior standing. Open to students who have shown ability, initiative, and industry on individual projects.
550. **INDEPENDENT STUDY IN ADVANCED SCULPTURE (5).** Pr., 3.0 minimum average in AT 454, 455 and 456, senior standing. Open to students who have shown ability, initiative, and industry on individual projects.

560. **INDEPENDENT STUDY IN ADVANCED ILLUSTRATION (5).** Pr., 3.0 minimum average in AT 464, 465, and 466, senior standing. Open to students who have shown ability, initiative, and industry on individual projects.
570. **INDEPENDENT STUDY IN ART HISTORY (3-3)†.** Pr., 18 hours of art history, senior standing. Open to students who have shown ability, initiative, and industry on individual projects. Research, drawings and reports on historical topics under supervision.

GRADUATE

- 621-622-623-624-625-626-627. **GRADUATE DESIGN AND ILLUSTRATION (5-5-5-5-5-5-5).** STUDIO 15-15-15-15-15-15-15. Open to MFA candidates only. Graduate level work in major areas of the broad based field of design and the arts. Members of these courses must have a good general background in the subjects and some previous experience in practice. Course work will include philosophical concepts, experimental studies and applied techniques. Liaison with industry is involved.
- 631-632-633-634-635-636-637. **GRADUATE PAINTING/DRAWING (5-5-5-5-5-5-5).** STUDIO 15-15-15-15-15-15-15. Open to MFA candidates only. Graduate level painting and/or drawing with student's choice of media and subject ideas. Students are expected to develop a mature personal style of work that exploits their full potential.
- 641-642-643-644-645-646-647. **GRADUATE PRINTMAKING (5-5-5-5-5-5-5).** STUDIO 15-15-15-15-15-15-15. Open to MFA candidates only. Graduate level printmaking with student's choice of media and subject ideas. Students are expected to develop a mature personal style of work that exploits their full potential.
- 671-672-673. **GRADUATE ART HISTORY RESEARCH (5-5-5).** Research on approved topics in art history with personal interpretations of the various movements. Consultations and written reports.
697. **CRITICAL ESSAY (5).** Pr., completion of all studio and art history requirements. The student is expected to give an in-depth critical evaluation of his own works as they relate to theories developed in his research of art history. Conferences with study committee and a formal, written report are required.
698. **TERMINAL STUDIO PROJECT (5).** Pr., completion of all studio and art history requirements. A major art problem consisting of a sustained single project or a logical sequence of shorter projects. The candidate will be required to conceive and execute a work or works exhibiting pronounced creative ability and technical proficiency. An exhibition of the completed project is required.

†(3-3) May be repeated for maximum of 6 hours.

Aviation Management (AM)

Professors Williams, *Head*
Associate Professor Kiteley
Assistant Professors Callan, Merritt, and Nichols
Flight Instructors Cash, Edwards, and Vedder
Visiting Instructor Dellinger

General Curriculum, GC, students (those with undeclared majors) may enroll only with departmental consent.

101. **INTRODUCTION TO AVIATION (3).** Orientation into aviation management career opportunities and a history of significant events and accomplishments in man's attempt to move through the air and space.
200. **AEROSPACE PROBLEMS ANALYSIS (5).** Pr., MH 161. Application of basic mathematical and physical concepts to problems in the aerospace industry.
201. **ELEMENTARY AERONAUTICS (5).** LEC. 5. Basic flight physiology, subsonic and supersonic aerodynamics, aircraft propulsion and structures, and aircraft maintenance management.
214. **FLIGHT ORIENTATION (1).** LAB 3. Basic flight experience course for non-pilots to familiarize aviation majors, engineers, teachers and other students desiring a limited exposure to flight. Course includes ground discussion, experience in flight simulator, and aircraft flight time. Special Fee. Course may be repeated up to three times.
- 215-216. **PRINCIPLES OF PRIVATE FLIGHT I, II (3-3).** General introduction and preparation for the FAA private pilot written examination. Topics: theory of flight, aircraft and engine performance, regulations, meteorology, navigation, airspace utilization, and aviation physiology.
- 217-218. **PRIVATE PILOT FLIGHT TRAINING I-II (1-1).** LAB. 3-3 for 217, Pr., AM 215. For 218 Pr., AM 216 and 217, or COI. Dual and solo flight instruction and discussion to prepare for FAA Private Pilot Certificate. Special Fee.
304. **ELEMENTARY METEOROLOGY (5).** LEC. 5. Pr., sophomore standing. Basic principles, causes, effects, and phenomena of weather with fundamental techniques of forecasting. Not open to AM students.
305. **AVIATION METEOROLOGY (5).** LEC. 5. Pr., PS 206. Basic meteorology as it applies to the operation of aircraft with emphasis on observation of weather elements and the interpretation of flight planning weather information.
306. **WEATHER OBSERVATION. (2).** Pr., AM 304 or AM 305. Techniques of weather observations and reporting of basic weather information for aviation. Provides assistance for qualification as a supplementary aviation weather station observer.
309. **RECIPROCATING ENGINES AND PROPULSION PRINCIPLES (3).** Pr., PS 206, CH 103 and AE 203. Coreq., PS 207 Introduction to basic laws of operation and types of power plants. Detailed coverage of reciprocating engines including principles of operations, major components and testing performance.

310. **JET PROPULSION (3).** Pr., AM 309 and AE 203. Introduction to the basic laws of thermodynamics and physics as applied to jet propulsion. The major sub sections are analyzed for their contribution to the overall engine performance. Basic testing, performance and maintenance operations are presented.
312. **PRINCIPLES OF AIR NAVIGATION (3).** Pr., AM 201. Practical air navigation and basic principles of aircraft guidance and control.
313. **AEROSPACE VEHICLE SYSTEMS (5).** Pr., PS 206. Design, use, and function of typical hydraulic, pneumatic and electrical systems used on aircraft.
314. **AEROSPACE MANAGEMENT AND OPERATIONAL PROBLEMS (5).** Pr., AE 203. Introduction to the use of operations research techniques. Included is the role of math modeling procedures, manual and computer generated solutions, applied to the decision making process.
322. **COMMERCIAL FLIGHT TRAINING I (1).** LAB. 3. Pr., Private Pilot Cert. and COI. Continuation of flight training toward a Commercial Pilot Certificate with emphasis on the development of precision and accuracy in all intermediate and advanced flight maneuvers. Special Fee.
323. **AIRCRAFT OPERATION AND PERFORMANCE (4).** LEC. 4. Pr., Private Pilot Certificate or COI. Principles of aircraft performance and operations aircraft systems, equipment, aviation weather theory and services, Federal Aviation regulations and preparation for FAA commercial written examination.
324. **COMMERCIAL FLIGHT TRAINING II (1).** LAB. 3. Pr., AM 322, Coreq., AM 323 and COI. Continuation of flight training toward a Commercial Pilot Certificate with emphasis on cross-country, night and instrument flying. Special Fee.
325. **PRINCIPLES OF INSTRUMENT FLIGHT (5).** LEC. 5. Pr., AM 323 or COI. Instruments, FAA regulations, air traffic control procedures, radio navigation, and aircraft operation and performances as applied to instrument flying. Preparation for the FAA Instrument Pilot written examination.
326. **COMMERCIAL FLIGHT TRAINING III (1).** LAB. 3. Pr., AM 324, Coreq., 325 and COI. Continuation of flight training for the Commercial Pilot Certificate with training in transition to complex aircraft. A continuation of instrument and night instruction and a review of all maneuvers for the commercial flight test. Special Fee.
327. **COMMERCIAL FLIGHT TRAINING IV (1).** LAB. 3. Pr., AM 326, Coreq., 325 and COI. Completion of FAA requirements for an unrestricted Commercial Pilot Certificate. Special Fee.
337. **AIR TRANSPORTATION (5).** Pr., junior standing. Significance of air transportation and the development of the present system. Economics and social costs of the air transportation system.
401. **AERONAUTICAL SEMINAR (1).** LAB. 2. Pr., senior standing. Special problems and current status of the aerospace industry.
402. **LAND USE CONTROL (2).** Pr., AM 409. The methods of control of the use of private property with particular emphasis on property near airports.
403. **GENERAL AVIATION MANAGEMENT (3).** Pr., junior standing. An overview of general aviation and its impact and interaction with the total aviation industry including a study of the various users, the suppliers and service organizations, the aircraft and facilities and regulatory framework.
404. **GENERAL AVIATION OPERATIONS (3).** LEC. 2, LAB. 3. Pr., AM 403. Current principles and practices in commercial aviation operations including organization, sources of revenue, functions, operation and typical problems. Laboratory assignments are provided through Auburn University Aviation.
405. **AVIATION SAFETY (3).** LEC. Pr., AM 201 or COI. Current problems and issues of aviation safety including aircraft accidents, their cause, effect, and the development of safety programs and procedures.
408. **AIR TRANSPORT PLANNING (3).** Pr., AM 409. Management decision making involved in selection of equipment, routes, and the establishment of rates by certificated and non-certificated air carriers.
409. **AEROSPACE LEGISLATION (3).** Pr., AM 407. Development and present status of federal, local and state, and international regulation of aviation using case study methods.
413. **AIRPORT MANAGEMENT (3).** Pr., junior standing. Current practices in management of a civil public airport, including organization, functions, operations, sources of revenue, funding, maintenance and administration.
414. **AIRPORT PLANNING (3).** Pr., AM 413, principles and procedures pertaining to planning airport facilities required to meet the immediate and future air transportation of a community or region.
417. **AIRLINE OPERATIONS (5).** Pr., AM 407, senior standing. Airline operations, organization, and managerial practices, the functions and planning process of various organizational components.
418. **INTERNATIONAL AIRLINES OPERATIONS (3).** Pr., AM 409, junior standing. International foreign air carriers, influences of ICAO and IATA, national ownership, determinants of power, operational and management practices, routes and fares.
419. **AIR TRAFFIC CONTROL (5).** LEC. 5. Pr., AM 312. Basic air traffic control procedures, facilities, centers, and operations.
420. **AIR CARGO OPERATIONS (3).** Pr., junior standing. Domestic and international air cargo operations with emphasis on cargo economics, equipment, domestic and international regulatory activities, agents, operational techniques, systems, and problems.
421. **COMMUTER AIRLINE OPERATIONS AND MANAGEMENT (3).** Pr., AM 409, coreq., AM 417 or COI. Management practices and operational characteristics of the commuter airline and its place in the air transportation system.

427. **MULTI-ENGINE TRAINING (2). LEC. 1, LAB. 3.** Pr., AM 327 or Commercial Pilot Certificate and COI. Instruction in the methods and techniques of multi-engine aircraft pilotage. Sufficient ground and flight instruction is given to qualify for the FAA pilot rating of Multi-Engine-Land. Special Fee.
428. **PRINCIPLES OF FLIGHT INSTRUCTION (3).** Pr., AM 327. The principles of teaching as applied to instructing, analyzing, and evaluating flight students with emphasis on preparation for the FAA Flight Instructors Written Examination.
429. **FLIGHT INSTRUCTOR TRAINING (1). LAB. 3.** Pr., 327 Commercial Pilot Certificate, Coreq., AM 428 and COI. Discussion, instruction, and arranged practice in flight instruction in preparation for the FAA Flight Instructor Certificate. Special Fee.
431. **MULTI-ENGINE FLIGHT TRAINING II (2). LEC. 2.** Pr., AM 327, coreq., AM 427 and COI. Principles of personnel transportation in night and IFR operations; includes aircraft operations, flight planning, weather decision, and passenger relations.
432. **PRINCIPLES OF PROFESSIONAL FLIGHT (3). LEC. 3.** Pr., AM 305, 325 and COI. Advanced aircraft performance IFR operations, high altitude meteorology, and FAR part 135. Overview of industry opportunities and required qualifications.
433. **TRANSPORT AIRCRAFT FLIGHT TRAINING (1). LAB. 3.** Pr., AM 327, 427, 431, and COI. Includes instrument and night instruction, emergency procedures and actual air transportation operations. Preparation for Airline Transport Pilot Certification if otherwise qualified. Special fee.
435. **INSTRUMENT FLIGHT INSTRUCTOR TRAINING (2). LEC. 1, LAB. 3.** Pr., AM 429 and COI. Discussion, instruction, and arranged practice in instrument flight instruction in preparation for the FAA Instrument Instructor Certificate. Special Fee.
437. **MULTI-ENGINE FLIGHT INSTRUCTOR TRAINING (2). LEC. LAB. 3.** Pr., AM 429 and COI. Principles and techniques of multi-engine flight instruction in preparation for FAA Multi-Engine Flight Instructor Rating. Special Fee.
491. **SPECIAL PROBLEMS (VARIABLE CREDIT 1-5).** Pr., department approval. Individual student endeavor under faculty supervision involving special problems of an advanced nature in aviation management. May be taken more than once with a maximum credit of 10 hours.

ADVANCED UNDERGRADUATE AND GRADUATE

551. **AEROSPACE SCIENCE (5).** A non-technical presentation of the principles and fundamentals of aviation and aerospace science, related systems, and related equipment. The course is primarily designed for students who require a general knowledge of aviation or aerospace science. It will include lectures by aerospace authorities and visits to aeronautical and aviation facilities. Not open to engineering students.

Biology (BI)

Coordinator and Professor Mason

For other staff and biology courses, see sections for Botany, Plant Pathology, and Microbiology and Zoology-Entomology.

101. **PRINCIPLES OF BIOLOGY (5). LEC. 4, LAB. 3.** All quarters. Integrated principles of biology with emphasis on organic macro-molecules, bioenergetics, cell structure and function, heredity, evolution, and ecology. This course designed specifically for the science-oriented curriculum. Credit will not be allowed for both BI 101 and BI 105.
102. **PLANT BIOLOGY (5). LEC. 4, LAB. 3.** Pr., BI 101. All quarters. The morphology, physiology, relationships, distribution, and importance of plants. This course designed specifically for the science-oriented curriculum.
103. **ANIMAL BIOLOGY (5). LEC. 4, LAB. 3.** Pr., BI 101. All quarters. The morphology, physiology, relationships, distribution, and importance of animals. This course designed specifically for the science-oriented curriculum. Credit will not be allowed for both BI 103 and BI 105.
105. **PERSPECTIVES IN BIOLOGY (5). LEC. 4, LAB. 2.** All quarters. Principles of biology with emphasis on the relationship between man and modern biological science. Broad topics include cell biology, inheritance, evolution, and introduction to ecology. This course is designed specifically for the student satisfying a general education requirement in natural science. Cannot be used to meet major or minor requirements in biological science. Credit will not be allowed for both BI 101 and BI 105.
106. **HUMAN BIOLOGY (5). LEC. 4, LAB. 1.** Pr., BI 105 or 101. All quarters. Introductory human anatomy and physiology with emphasis on recent improvements in health care. This course is designed specifically for the student satisfying a general education requirement in natural science. Cannot be used to meet major or minor requirements in biological science. Credit will not be allowed for both BI 106 and BI 103.
107. **ENVIRONMENTAL BIOLOGY. (5). LEC. 5.** Pr., BI 105 or 101. Fall, Winter, Spring. An introductory ecological approach to understanding man's impact and dependence on the natural environment. Broad topics include ecosystems, nutrient cycles, pollution, pest management, conservation of natural resources, energy, and human population. This course is specifically designed for the student satisfying a general education requirement in natural science. Cannot be used to meet major or minor requirements in biological science.

Botany, Plant Pathology, and Microbiology (BY) (MB)

Professors Gudauskas, *Acting Head*, Backman, Curl, N. Davis, Diener, Lemke, Marshall, Mason, McGuire, Morgan-Jones, Patterson, Peterson, Rodriguez-Kabana, Truelove, Weete, and Williams
 Associate Professors Blevins, Clark, Cody, Freeman, V. Kelley, W. Kelley, and Latham
 Assistant Professors Bisaro, Brown, Campbell, T. Davis, Dute, and Shands
 Adjunct Assistant Professor Stout
 Instructor Causey
 Adjunct Instructors Corsby and Geiger

With few exceptions Principles of Biology, BI 101, and Plant Biology, BI 102, are prerequisite to all courses in this department. For a description of these and other general biology courses see the section for Biology (above). For additional offerings in microbiology consult the curriculum in Veterinary Medicine (VM), especially with reference to advanced courses in Veterinary Microbiology (VMI). A program in Biological Statistics (BST) is also administered through the Department of Botany, Plant Pathology, and Microbiology.

BOTANY (BY)

- 306. **FUNDAMENTALS OF PLANT PHYSIOLOGY (5). LEC. 3, LAB. 4.** Pr., BI 102, CH 203 or 207 or equivalent. Fall, Winter, Spring. General aspects of fundamental life processes of plants involving physiological, structural, and environmental relationships.
- 309. **GENERAL PLANT PATHOLOGY (5). LEC. 4, LAB. 2.** Pr., BI 101-102. Winter, Spring. Nature cause, and control of plant diseases illustrated by studies of the more common diseases of cultivated crops.
- 310. **FOREST PATHOLOGY (3). LEC. 1, LAB. 4.** Pr., BI 101-102 or equivalent. Spring. Diseases of forest and ornamental trees from seedling to maturity including cause, identification, prevention, and control; decay in timber and forest products. Field trips emphasize major tree diseases in Alabama.
- 320. **WEED IDENTIFICATION AND ECOLOGY (3). LEC. 2, LAB. 3.** Pr., BI 101-102 or equivalent. Spring. Identification of weeds in vegetative state. Weed distribution and environmental requirements. Field trips will be taken and weed collections will be required.
- 321. **FATE OF PESTICIDES IN THE ENVIRONMENT (3). LEC. 2, LAB. 3.** Pr., BI 101-102, CH 207 or equivalent. Spring. Pesticide absorption, translocation by plants and effects on plant processes. Behavior of herbicides in soils and effects on soil microorganisms. Mechanisms of herbicide inactivation and the basis for herbicide selectivity.
- 403. **PESTICIDES (5). LEC. 4, LAB. 3.** Pr., CH 207. Winter. The chemistry, mode of action, activity, formulations, applications, and legal aspects of pesticides and pesticide applications.
- 407. **CONCEPTS OF PEST MANAGEMENT (5). LEC. 4, LAB. 3.** Pr., COI. Spring. Pest management technology and philosophy.
- 460. **SPECIAL PROBLEMS (1-3).** Pr., COI, senior standing. All Quarters. A. Anatomy; B. Ecology; C. Morphology; D. Pathology; E. Physiology; F. Taxonomy; G. Applied Microbiology; H. Diagnostic Microbiology; I. Microbial Ecology; J. Microbial Physiology; K. Microbial Taxonomy; L. Virology; A student cannot register for more than 3 hours credit in any one quarter or any one area.

ADVANCED UNDERGRADUATE AND GRADUATE

- 505. **INTRODUCTORY MYCOLOGY (5). LEC. 3, LAB. 4.** Pr., BI 101-102 or equivalent. Fall. A systematic survey of the fungi with emphasis on morphology.
- 506. **SYSTEMATIC BOTANY (5). LEC. 3, LAB. 4.** Pr., BI 101-102 or equivalent. Spring, Summer, Fall. Identification, classification, nomenclature, distribution and systematic relationship of the seed-bearing plants, utilizing primarily elements of the local flora as study material. The historical background, literature of plant taxonomy, and rules of nomenclature. Field trips will include an overnight week-end field trip.
- 507. **SALT MARSH ECOLOGY (6). LEC. 4, LAB. 12.** Pr., ten hours of biology including introductory botany. Summer. The botanical aspects of local marshes; includes plant identification, composition, structure, distribution and development of coastal marshes. Offered only at the Gulf Coast Research Laboratory. Ocean Springs, Miss.
- 509. **MARINE BOTANY (6). LEC. 5, LAB. 12.** Pr., ten hours of biology, including introductory botany, or COI. Summer. Survey, based upon local examples, of the principal groups of marine algae and maritime flowering plants, involving their structure, reproduction, distribution, identification, and ecology. Restricted to participants in the Gulf Coast Research Laboratory Teaching Session at Ocean Springs, Miss.
- 510. **COASTAL VEGETATION (4). LEC. 3, LAB. 10.** Pr., ten hours of biology, including introductory botany. Summer. General and specific aspects of coastal vegetation, with emphasis on local examples. Offered only at the Gulf Coast Research Laboratory. Ocean Springs, Miss.
- 513. **GENERAL PLANT ECOLOGY (5). LEC. 3, LAB. 4.** Pr., BY 306. Fall and Spring. Natural vegetation, environment, and interrelationships between the two with primary emphasis on the Southeastern United States. Field trips will be made, including an overnight week-end trip.

514. **BIOLOGICAL MICROSCOPY (5).** LEC. 2, LAB. 6. Pr., BI 102-103 or equivalent. Fall. Methods of tissue preparation for observation with the light microscope, including fixing, paraffin and plastic embedding, sectioning, general and cyto-chemical staining, and mounting. Squash techniques. Optical microscopy, micrometry, and photomicrography. Techniques for developing, printing, enlarging, and copying for photographic illustration. Preparation of 2 x 2 transparencies.
517. **MARINE BOTANY (6).** LEC. 8, LAB. 24, 4 days/5 weeks. Pr., BI 101-102 or equivalent. General survey of marine algae, vascular and non-vascular plants associated with the marine and estuarine environment. Structure, reproduction, identification, distribution, and ecology are considered. Offered only at Dauphin Island Sea Laboratory.
518. **MARSH ECOLOGY (6).** LEC. 8, LAB. 24, 4 days/5 weeks. Pr., advanced standing in biology. Floral and faunal elements various marine marsh communities. Interaction of physical and biological factors will be emphasized. Structured to provide actual field experience. Trips scheduled to acquaint students with examples of marsh types. Offered only at Dauphin Island Sea Laboratory.
530. **PLANT NEMATOLOGY (5).** LEC. 2, LAB. 6. Pr., BY 309, BI 101 or COI. Fall, odd years. Various roles of nematodes in relation to plant diseases caused by the nematodes and other pathogens. Identification of the plant nematodes nature of pathogenicity; principles and practices of control; recent advances in phytonematology.
535. **PLANT DEVELOPMENT: CELLS AND TISSUES (5).** LEC. 3, LAB. 4. Pr., BI 101-102 or equivalent. Fall. The structure and development of plant tissues and their constituent cells. Such topics as the ontogeny of vascular tissue and the structural control of cellular communication will be explored in depth.
536. **PLANT DEVELOPMENT: ORGANS (5).** LEC. 3, LAB. 4. Pr., BI 101-102 or equivalent. Winter. Comparative anatomy of vascular plants with emphasis on structural and developmental relationships of the vegetative and reproductive organs of seed plants. A review of current anatomical, experimental and ultrastructural research of roots, stems, leaves, and flowers.
537. **PLANT MORPHOGENESIS (5).** LEC. 3, LAB. 4. Pr., BI 101-102 or equivalent and BY 306. Spring. Factors responsible for control and development of form in nonvascular and vascular plants. Laboratory procedures will be largely experimental including techniques for the sterile culture of plant spores, embryos, and excised tissues and organs.
550. **METHODS IN PLANT PATHOLOGY (3).** LAB. 6. Pr., MB 300, BY 309 or equivalent. Fall. Methods for field assessment of disease damage and sampling disease diagnosis. Preparation of culture media. Procedures for isolation and identification of causal agent, and proof of pathogenicity.
551. **FOLIAGE HARVEST AND STORAGE DISEASES (4).** LEC. 3, LAB. 2. Pr., 309 or equivalent. Fall. Survey of major diseases of aerial plant parts and fruits. Principles of epidemiology. Harvest diseases and storage problems.
552. **SOIL-AND SEED-BORNE DISEASES OF PLANTS (4).** LEC. 2, LAB. 4. Pr., BY 309 or equivalent. Spring. Important diseases of seeds, roots, and other subterranean plant parts; including vascular disorders, pathogen ecology, and disease control.
553. **PRINCIPLES OF PLANT DISEASE CONTROL (3).** LEC. 2, LAB. 2. Pr., BY 309. Spring. Control of important plant diseases utilizing the principles of protection and resistance emphasizing chemical control by protectant and systemic fungicides, antibiotics, fumigants, eradication, exclusion, non-target effects, and integrated control systems.
554. **PHYSIOLOGY OF FUNGI (5).** LEC. 3, LAB. 4. Pr., BY 505 and one of the following: MB 300, BY 306, or ADS (CH) 518 or COI. Spring, odd years. Cellular structure, function, nutrient requirements and absorption, metabolism during the vegetative growth cycle, spore germination and spore formation, mode of action of agriculturally important fungicides, and the physiology of fungal-induced plant pathogenesis.

GRADUATE

604. **ADVANCED PLANT PHYSIOLOGY I (5).** LEC. 3, LAB. 4. Pr., BY 306 and 10 hours of organic chemistry. Winter. Molecular biology and plant metabolism; a correlation of the fine structures of the cell with metabolic pathways occurring therein.
605. **ADVANCED PLANT PHYSIOLOGY II (5).** LEC. 3, LAB. 4. Pr., BY 604 and COI. Fall. Water relations and mineral nutrition. Internal and external factors affecting the absorption, translocation, utilization, and loss of water and mineral elements by green plants.
606. **ADVANCED PLANT PHYSIOLOGY III (5).** LEC. 3, LAB. 4. Pr., BY 604 and COI. Spring. Plant growth. A review of literature and laboratory methodology of plant physiological subject matter in the areas of plant growth regulators, mode of action of growth regulators, and factors affecting plant growth.
607. **ULTRASTRUCTURE OF PLANT CELLS AND MICROBES (5).** LEC. 3, LAB. 4. Pr., COI. Winter. Subcellular construction of plant cells, fungi, and bacteria. Laboratory experience in the use of transmission and scanning electron microscopes will supplement lecture material.
608. **ADVANCED SYSTEMATIC BOTANY (5).** LEC. 2, LAB. 6. Pr., BY 506. Fall. Experimental and research aspects of the taxonomy of vascular plants. The literature, techniques and methodology relative to the identification and biosystematic classification of evolutionary units; intensive study of special groups of plants and the application of resultant data to specific taxonomic problems.
616. **CYTOLOGY AND CYTOGENETICS (5).** LEC. 3, LAB. 4. Pr., ZY 300. Winter. Cell structure and function with emphasis on cell reproduction and factors contributing to the evolution of organisms.
617. **PHYTOVIROLOGY (5).** LEC. 3, LAB. 4. Pr., BY 309 or 310, MB 542. Winter, odd years. Molecular biology, transmission, pathogenicity and control of viruses that infect plants.

618. **CLINICAL PLANT PATHOLOGY (5). LEC. AND LAB. 8.** Pr., BY 309 or equivalent or COI. Summer, even years. Approaches, techniques, and practical experiences in the diagnosis of plant diseases.
619. **ADVANCED PLANT PATHOLOGY (5). LEC. 3, LAB. 4.** Pr., BY 309 or equivalent. Summer, odd years. Biological significance of etiology, epiphytology, and host-parasite relations in plant diseases. Classical and current theory will be considered in relation to concepts and problems in plant pathology.
625. **SPECIAL PROBLEMS. (CREDIT TO BE ARRANGED.)** A. Cytology; B. Ecology; C. Morphology; E. Nematology; F. Pathology; G. Physiology; H. Taxonomy; I. Chemical Weed Control; J. Marine Botany; K. General Biology Teaching & Permission of Instructor; L. Virology; M. Microbial Ecology; N. Experimental Microbiology; O. Clinical Microbiology; P. Medical Virology; Q. Serology; R. Microbial Physiology; S. Microbial Taxonomy; T. Mycotoxicology; U. Plant Anatomy; V. Ultrastructure; W. Molecular Genetics.
626. **ADVANCED MYCOLOGY I (5). LEC. 2, LAB. 6.** Pr., BY 505 and COI. Spring, even years. Classification of fungi and lichens. Detailed studies of selected families of Ascomycetes and Fungi Imperfecti. Interpretation of comparative morphological criteria and ontogenic patterns as a guide to phylogeny. Intensive floristic investigations of particular habitats.
627. **ADVANCED MYCOLOGY II (5). LEC. 2, LAB. 6.** Pr., 505 and COI. Spring, odd years. Classification of fungi. A detailed survey of the Myxomycetes, Phycomycetes, and Basidiomycetes. Special emphasis will be placed on ecological aspects of fungi in freshwater and forest habitats. Fungal genetics will be studied.
628. **FIELD RESEARCH IN PLANT PATHOLOGY (5). LEC. 2, LAB. 6.** Summer, even years. Field plot design, techniques for applying pesticides, evaluation of disease development, estimation of yield losses, and analysis of data.
640. **DEPARTMENTAL FORUM (1).** Required of all majors, open to all minors. May be taken more than one quarter. Fall, Winter, Spring. Discussions concerning current topics in the various sciences and related fields.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **DOCTORAL RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

MICROBIOLOGY (MB)

300. **GENERAL MICROBIOLOGY (5). LEC. 3, LAB. 4.** pr., BI 101, CH 203 or 207. All quarters. Fundamentals of microbiology including history of microbiology, cell structure, chemical composition, growth, nutrition, metabolism, genetics, classification, cultivation, and distribution of bacteria, viruses, rickettsia, and fungi; discussion of the effects of chemical and physical agents on the growth of microorganisms. Credit in this course precludes credit for BY 302.
302. **MEDICAL MICROBIOLOGY (5). LEC. 3, LAB. 4.** Pr., BI 101, CH 203 or 207. Fall, Spring. Etiology, epidemiology, immunity, identification and pathogenesis of microorganisms of medical importance to man. Credit in this course precludes credit for BY 300. A similar statement is shown for BY 300 above.
446. **CLINICAL AND PATHOGENIC MICROBIOLOGY (5). LEC. 2, LAB. 6.** Pr., MB 300, junior standing. Fall, Spring. Isolation, cultivation, identification, classification and pathogenesis of infectious agents, including clinical materials: Mycoplasmata (PLO), Rickettsiae, and Spirochaetes.
460. **SPECIAL PROBLEMS (1-3).** Pr., COI senior standing. All Quarters. A. Anatomy; B. Ecology; C. Morphology; D. Pathology; E. Physiology; F. Taxonomy; G. Applied Microbiology; H. Diagnostic Microbiology; I. Microbial Ecology; J. Microbial Physiology; K. Microbial Taxonomy; L. Virology; A student cannot register for more than 3 hours credit in any one quarter of any one area.

ADVANCED UNDERGRADUATE AND GRADUATE

503. **BACTERIAL TAXONOMY (5). LEC. 3, LAB. 4.** Pr., MB 300. Winter. International Code of Nomenclature of bacteria. The development of microbiological literacy; classification of taxa based on phylogeny, molecular and numerical concepts.
504. **INDUSTRIAL MICROBIOLOGY (3). LEC. 3.** Pr., MB 300. Winter. Principles and practices of microbiologists in industry areas surveyed to include manufacture of fermented foods, alcoholic beverages, antibiotics, amino acids, enzymes, and single-cell protein.
508. **MARINE MICROBIOLOGY (7½). LEC. 5, LAB. 12.** Pr., MB 300 and COI. Summer. Introduces the student to the role of microorganisms in the oceans and estuaries. Special emphasis on bacteria and fungi. Lecture and laboratory work includes sampling procedures, taxonomy of marine bacteria, mineralization, microbial fouling, pollution, and diseases of marine animals. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Miss.
521. **INDUSTRIAL MICROBIOLOGY LABORATORY (3). LAB. 6.** Pr., MB 504. Spring. Methods for production, detection, purification of microbial products, and one or more projects on fermentations or industrial processes of special interest to the student.
522. **GENE EXPRESSION AND RECOMBINANT DNA (5). LEC. 3, LAB. 4.** Pr., BI 101 and 102, MB 300, ZY 300. Spring. Structure and function of genes; concepts and techniques in recombinant DNA.
540. **MICROBIAL PHYSIOLOGY AND GENETICS (3). LEC. 3.** Pr., MB 300, CH 203 or 207. Fall. Cellular structure, function, nutritional requirements, energy metabolism, growth cycles, active transport mechanisms, biosynthesis, and mutation and genetics.
541. **ENVIRONMENTAL MICROBIOLOGY (5). LEC. 3, LAB. 4.** Winter, even years. Pr., BY 300. Theory and application of fundamental principles of microbiology, ecology and biochemistry of microorganisms in the environment.

542. **GENERAL VIROLOGY (5). LEC. 3, LAB. 4.** Pr., MB 300, and ZY 300 or equivalent. Fall. The molecular biology of bacterial, plant, and animal viruses; pathogenesis, diagnosis, and cultivation.
543. **IMMUNOLOGY (5). LEC. 3, LAB. 4.** Pr., MB 300, junior standing. Winter. Immunobiology and immunochemistry of humoral and cellular mechanisms of immunity.
545. **MICROBIAL PHYSIOLOGY LABORATORY (3). LAB. 6.** Pr., MB 540 or concurrently enrolled. Fall. Laboratory experiments conducted on instrumentation, staining mechanisms, protoplast formation, cellular function. Warburg respirometry. Nephelometry, bioassay, U.V. light irradiation and photoreactivation, mutation, antibiotic sensitivity, and ultrasonic rupture of organisms.
556. **FOOD MICROBIOLOGY (5). LEC. 3, LAB. 4.** Pr., MB 300. Spring. Relationship of habitat to the occurrence of microorganisms on food, environment affecting the growth of various microorganisms in food; microbiological action in food spoilage and food manufacture; physical, chemical and biological destruction of microorganisms in foods; microbiological examination of foodstuffs; and public health and sanitation microbiology.

GRADUATE

609. **BIOMEMBRANES (4). LEC. 4.** Pr., CH 518 and 519. Winter, odd years. Discussion of the structure and function of biological membranes. Experimental and theoretical aspects of membrane structure, isolation, and characterization of membrane components will be presented. Microbial and plant membrane systems will be emphasized.
610. **ADVANCED MICROBIAL PHYSIOLOGY (5). LEC. 2, LAB. 6.** Pr., MB 540, CH 518. Spring, even years. Physiology of microorganisms; energy transfer mechanisms, metabolism, sexuality and mutation.
611. **ADVANCED MICROBIAL GENETICS (5). LEC. 3, LAB. 4.** Pr., MB 540, ZY 300. Spring, odd years. Transmission, expression and alteration of genetic information in microorganisms, including the application of methods in microbial genetics to the study of prokaryotes and eukaryotes.
613. **SYSTEMATIC BACTERIOLOGY (5). LEC. 2, LAB. 6.** Pr., MB 503. Summer, odd years. Isolation, purification, and identification of bacteria; experimental application of international rules of nomenclature.
624. **PHYTOBACTERIOLOGY (5). LEC. 2, LAB. 6.** Pr., MB 300. Summer. Experimental and theoretical aspects of isolation, identification, pathogenicity, and infectivity of plant pathogenic bacteria.
625. **SPECIAL PROBLEMS. (CREDIT TO BE ARRANGED.)** A. Cytology; B. Ecology; C. Morphology; D. Mycology; E. Nematology; F. Pathology; G. Physiology; H. Taxonomy; I. Chemical Weed Control; J. Marine Botany; K. General Biology Teaching & Permission of Instructor; L. Virology; M. Microbial Ecology; N. Experimental Microbiology; O. Clinical Microbiology; P. Medical Virology; Q. Serology; R. Microbial Physiology; S. Microbial Taxonomy; T. Mycotoxicology; U. Plant Anatomy; X. Ultrastructure; W. Molecular Genetics.
640. **DEPARTMENTAL FORUM (1).** Required of all majors, open to all minors. May be taken more than one quarter. Fall, Winter, Spring. Discussions concerning current topics in the various sciences and related fields.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **DOCTORAL RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

BIOLOGICAL STATISTICS (BST)

210. **MICROCOMPUTER APPLICATIONS IN AGRICULTURE (3). LEC. 2, LAB. 3.** Pr., 10 hours of mathematics. Fall, Winter. Introduction of microcomputer technology to increase understanding of the use of computer decision aids in agricultural careers; microcomputer hardware including microprocessor, display, keyboard, data storage and retrieval, printer and communication options; microcomputer software including languages, electronic spreadsheet, word processing, data based management, and programmed products; and microcomputer interface with data source and processing systems. (Same as AEC 210).
215. **INTRODUCTORY BIOLOGICAL STATISTICS (5). LEC. 4, LAB. 2.** Pr., MH 160. Fall, Winter. Elementary statistics as applied to agriculture and biology including an introduction to empirical frequency distributions, descriptive statistics, elementary probability, sampling, estimation, testing hypotheses, linear regression, correlation, and the analysis of variance.
216. **INTRODUCTORY BIOLOGICAL COMPUTATIONS (3). LEC. 3.** Pr., sophomore level. Winter, Spring. Introductory use of the computer for agricultural and biological computations and data reduction. Introduction to FORTRAN programming and to effective and valid use of available program packages in biology.
313. **SAMPLING I (4). LEC. 3, LAB. 3.** Pr., MH 163. Fall. Basic concepts and procedures of statistical sampling as applied to forest resource assessment and management. (Same as FY 313.)

ADVANCED UNDERGRADUATE AND GRADUATE

501. **BIOLOGICAL STATISTICS (5). LEC. 4, LAB. 2.** Pr., MH 161. Fall, Winter, Spring. Basic concepts of experimental statistics, distributions, confidence limits, tests of significance, analysis of variance, linear correlation and regression. For advanced undergraduates and as a beginning course for graduate students in biological sciences.
511. **SAS PROGRAMMING (2). LEC. 2.** Pr., BST 501 or equivalent and BST 216 or equivalent. Fall, Spring. Introduction to statistical analysis and management of data files using SAS, The Statistical Analysis System. Data entry and management will be emphasized along with selection and execution of the important statistical procedures.

GRADUATE

601. **BIOLOGICAL STATISTICS II (5).** LEC. 4, LAB. 2. Pr., BST 501 or equivalent. Winter. Analysis of variance, randomized block, Latin square and split plot designs, factorials, analysis of covariance, and multiple regression.
602. **LEAST SQUARES ANALYSIS OF EXPERIMENTS (5).** LEC. 4, LAB. 2. Pr., BST 501 and 601 or equivalent. Spring, even years. Analysis and interpretation of experimental data by least squares procedures; general linear models and hypotheses; weighted regression; irregular two-factor design.
625. **SPECIAL PROBLEMS. (CREDIT TO BE ARRANGED.)** All Quarters. A. Biological Statistics; B. Statistical Genetics.

Building Science (BSC)

Professor Brandt, *Head*, Aderholdt
Associate Professors Lechner, Mol, Taylor, and Timberlake
Assistant Professors Cooper, Weiss, and Williams
Adjunct Associate Professor Darden
Instructor Stabler

100. **DRAWING & PROJECTIONS (2).** LAB. 6. Basic architectural drafting techniques.
202. **MATERIALS OF CONSTRUCTION (5).** Pr., MH 160. A survey of common building materials.
203. **BLUEPRINT READING AND WORKING DRAWINGS (4).** LEC. 1, LAB. 9. Pr., BSC 100 or TS 102 or AR 110. Graphic construction communications — working drawings, shop drawings, etc.
204. **CONSTRUCTION SYSTEMS (3).** Construction systems for foundations, floors, roofs, and walls.
211. **MECHANICS OF STRUCTURES (5).** Pr., MH 161, PS 205. Principles of mechanics as applied to building construction; resolution of external forces; analysis of trusses; shear and bending moments.
- 261-262. **HISTORY OF BUILDING I-II (3-3).** The development and use of construction methods and materials showing the effects on building from ancient to contemporary times.
311. **STRENGTH OF MATERIALS (5).** Pr., BSC 211 and junior standing in AR or BSC (no PAR or PBSC). Strength of materials of structural members. Lectures, problems.
314. **REINFORCED CONCRETE (5).** Pr., BSC 311. Reinforced concrete. Lectures, research and problems.
315. **APPLIED STRUCTURES (5).** Pr., BSC 314. Applied design of beams and columns in wood and steel.
323. **FOUNDATIONS & SOILS (3).** Pr., BSC 311. Soil conditions and their effects on building foundations.
324. **CONSTRUCTION SURVEYING (3).** LEC. 2, LAB. 3. Pr., BSC classification. Dimensional controls for buildings.
325. **FORMWORK DESIGN (3).** Pr., BSC 311. Design of concrete formwork.
340. **CONSTRUCTION SAFETY AND HEAVY EQUIPMENT (3).** Pr., BSC classification. Construction operations safety and heavy equipment used in construction.
351. **ENERGY AND BUILDINGS (3).** Pr., junior standing. (no PAR or PBSC). A survey of the effects of climate, design, materials, and systems on the energy consumption of buildings. Various energy sources (solar, etc.) will be investigated.
- 352-353. **BUILDING EQUIPMENT I-II (3-3).** Pr., PS 207. (no PAR or PBSC). Analysis of heating, air conditioning, water supply, plumbing and electrical systems as related to buildings. Lectures, readings, problems.
399. **EXPERIENTIAL LEARNING (2-5).** Pr., sophomore standing and COI. May be repeated once for credit. Students may obtain academic credit for participation in learning experiences of a practical nature outside the normal curricular offerings of the University. Graded S-U.
- 405-406. **CONTRACTING BUSINESS I-II (3-3).** Pr., senior standing in BSC (no pre-BSC). Organizing, managing, and operating the contracting firm.
421. **CONSTRUCTION ESTIMATING I (4).** Pr., junior standing in BSC (no pre-BSC). Detailed estimating of building component quantities.
431. **CONSTRUCTION ESTIMATING II (4).** Pr., BSC 421 and senior standing. Estimating direct and indirect construction costs.
434. **CONSTRUCTION SCHEDULING (5).** Pr., BSC 421 and senior standing. Management techniques for planning, scheduling, controlling costs, and leveling manpower by use of CPM.
460. **SPECIAL PROBLEMS (CREDIT 1-5).** Pr., department head approval, junior standing. Development of an area of concentration through independent study under staff supervision.
490. **TERMINAL PROJECT (8).** LEC. 2, LAB. 15. Pr., BSC 405 and 431, final quarter prior to graduation. Cost Analysis and Construction Program for a building or special study (each as approved by the Faculty Committee). Construction program to include all documents required by the Contract and/or necessary to construct the project. Candidate will defend project orally before staff and guest specialists.

Chemical Engineering (CHE)

Professor Chambers, *Head*, Guin, Hsu, Lee, Neuman, and Tarrer

Associate Professors Hirth, Roos, and Vives

Assistant Professors Krishnagopalan, Placek, Tatarchuk, and Williams

General Curriculum (GC) students (those with undeclared majors) may enroll only with departmental consent.

210. **MATERIAL BALANCES (3).** Coreq., CHE 113. Application of principles of material balances to chemical processes.
211. **ENERGY BALANCES (4).** Pr., CHE, 210, 213, CH 113. Energy balance principles and calculations in processes involving physical changes and chemical reactions. Computer applications.
- * 213. **DIGITAL COMPUTERS IN CHEMICAL ENGINEERING (3).** LEC. 2, LAB. 3. Pr., MH 162. WATFIV and FORTRAN languages and applications to practical chemical engineering problems. Introduction to interactive computing (TSO).
326. **CHEMICAL REACTION ENGINEERING (4).** Pr., MH 265, CHE 336. Design of chemical reactors with reaction systems.
336. **CHEMICAL ENGINEERING THERMODYNAMICS I (4).** Pr., MH 163, CHE 210, 213. Coreq., CHE 113. First and second laws of thermodynamics, non-ideal gases, heat engines, refrigeration, and liquefaction.
337. **CHEMICAL ENGINEERING THERMODYNAMICS II (4).** Pr., CHE 336. Thermodynamics of phase and chemical equilibrium.
346. **STAGewise OPERATIONS (4).** Pr., CHE 211. Principles, design, and industrial applications of stagewise processes such as extraction and distillation.
361. **FLUID MECHANICS (4).** Pr., PS 220. Coreq., MH 265. Coreq., CHE 211 or 336. Includes conservation equations, fluid statics, dimensional analysis, design calculations for conduits, and introduction to rheology, boundary layer theory, compressible fluid flow, flow measurement, and turbomachinery.
362. **HEAT TRANSFER (4).** Pr., CHE 361, CHE 211 or 336, MH 265. Heat transfer via conduction and convection, heat exchanger design, evaporation.
363. **MASS TRANSFER (4).** Pr., CHE 362. Mass transfer fundamentals and applications of mass transfer principles to the design of gas absorption, drying, and humidification equipment.
382. **CHEMICAL ENGINEERING LABORATORY I (3).** LEC. 1, LAB. 6. Pr., CHE 336, 362. Industrial chemical engineering equipment. Experimental study of heat and momentum transfer and other topics.
401. **COAL PROCESSING TECHNOLOGY (3).** Structure, properties, chemistry, and utilization of coal.
402. **SOLAR THERMAL PROCESSES (3).** Pr., CHE 362. Solar energy fundamentals, solar heat transfer, solar heating devices.
410. **PULP AND PAPER ENGINEERING — Pulp (4).** LEC. 3, LAB. 4. Pr., CHE 362, CH 304. Coreq., CHE 363 and junior standing. Chemical and engineering principles involved in the manufacture of various wood pulps from raw material.
411. **PULP AND PAPER ENGINEERING — Paper (4).** LEC. 3, LAB. 4. Pr., CHE 362. Coreq., CHE 363 and junior standing. Chemical and engineering principles involved in the preparation of fiber furnishes and in the manufacture of paper.
450. **SPECIAL TOPICS IN CHEMICAL ENGINEERING. (CREDIT TO BE ARRANGED WITH A MAXIMUM OF 10 HOURS.)** Topical courses in special areas. May include laboratory work. May be taken more than once.
470. **SEMINAR (1).** Senior Seminar. Pr., senior standing. Lectures on current topics in chemical engineering.
479. **HONORS THESIS (3-5).** Pr., junior standing, COI. For honors program students only. Repeatable once for a maximum total of 6 hrs.
490. **DIRECTED READING (1).** Pr., COI. Supervised study.
499. **UNDERGRADUATE RESEARCH (3).** Pr., junior standing, COI. GPA above 3.0. Individual and small group projects. May be taken twice for credit.

ADVANCED UNDERGRADUATE AND GRADUATE

515. **INTERMEDIATE COMPUTER APPLICATIONS IN CHEMICAL ENGINEERING (4).** Pr., CHE 361. Applications of computer software to solve chemical engineering problems. Problems will be selected from a wide variety of areas to demonstrate the features of each language presented.
516. **PROCESS DYNAMICS AND CONTROL (4).** Pr., CHE 326, 346, 382, PS 221. Mathematical modelling and dynamic analysis of chemical processes. Feedback control, stability, and frequency response of linear, single variable systems.
517. **DIGITAL PROCESS CONTROL (4).** Pr., CHE 516. Analysis and design of computer control systems. Advanced topics in process control: feedforward control, cascade control, multivariable control, compensation control, and others.
518. **PROCESS DYNAMICS AND CONTROL LABORATORY (2).** LAB. 6. Coreq., CHE 517. Laboratory experiments in classical and computer control. Computer simulation of control systems. Demonstration and practice of theory taught in CHE 516 and 517.

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540. **NUCLEAR ENGINEERING (5).** Pr., PS 305 or 320, MH 265, or COI. Atomic physics and nuclear reactions. Nuclear reactor principles, design, and engineering, including radiation, shielding, instrumentation, and heat transfer.
545. **PROCESS ECONOMICS AND DESIGN (4).** LEC. 3, LAB. 3. Pr., CHE 326, 346, 363. Fundamentals and applications of process economics and design. Applications of process improvement and trouble-shooting. Computer-aided profitability analysis. Case studies.
546. **COMPUTER-AIDED PROCESS SIMULATION (4).** LEC. 2, LAB. 6. Pr., CHE 337, 545. Fundamentals and applications of computer-aided process simulation. Case studies.
547. **COMPUTER-AIDED PROCESS DESIGN (4).** LEC. 2, LAB. 6. Pr., CHE 546. Fundamentals of process synthesis. Case studies in process design.
560. **INTRODUCTION TO PLASTICS (3).** Pr., CH 304 or COI. High polymers. Includes the chemistry, technology and uses of cellulose, phenolics and amino plastics, polyolefins, vinyls, styrene, acrylics, polyesters, epoxies, polyamides, polyurethanes, silicones, and rubbers.
561. **TRANSPORT PHENOMENA (4).** Pr., MH 265, CHE 210. Momentum, heat, and mass transport in one-dimensional non-turbulent systems.
565. **INDUSTRIAL WASTE WATER TREATMENT (4).** Pr., CHE 326. Introduction to chemical treatment methods for industrial waste water pollutants. Identification and analysis of major industrial water pollutants. Design and cost considerations in chemical process treatment equipment.
575. **RATE PROCESSES IN MATERIALS (3).** Pr., CH 508 or COI. Diffusion in the gas, liquid and solid phases and the fundamentals of chemical reaction kinetics pertinent to the crystallization and transformation of materials.
585. **AIR QUALITY ENGINEERING (4).** Pr., CHE 363. Sources and chemical nature of air pollutants. Principles of mass transfer as related to the removal of air pollutants. Design calculations and engineering of air pollution control equipment including adsorption and absorption.
586. **CHEMICAL ENGINEERING LABORATORY II (3).** LEC. 1, LAB. 6. Pr., CHE 346, 363, 382. Coreq., CHE 326. Experimental study of mass transfer and reaction engineering.
587. **CHEMICAL ENGINEERING LABORATORY III (3).** LAB. 9. Pr., CHE 326, 586. Comprehensive open-ended projects.
595. **BIOCHEMICAL ENGINEERING (3).** Coreq., CHE 326. Kinetics and reactor design for enzymatic and fermentation processes. Introductory cell biochemistry.

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600. **CHEMICAL ENGINEERING ANALYSIS I (3).** Pr., graduate standing. Mathematical analysis of chemical engineering problems to include the formulation of differential equations, analytical and numerical techniques for problem solution, data correlation and analysis, and computer applications.
601. **CHEMICAL ENGINEERING ANALYSIS II (3).** Pr., CHE 600. Numerical methods for the solution of chemical engineering problems. Computer application.
610. **TRANSPORT PHENOMENA I (3).** Coreq., CHE 600. Principles of momentum, heat, and mass transport in nonturbulent systems.
611. **TRANSPORT PHENOMENA II (3).** Pr., CHE 610. A continuation of CHE 610 with applications to turbulent systems.
620. **CHEMICAL ENGINEERING THERMODYNAMICS I (3).** Pr., graduate standing. Properties of real gases and liquids, chemical and phase equilibrium.
621. **CHEMICAL ENGINEERING THERMODYNAMICS II (3).** Pr., CHE 620. Phase equilibrium of non-electrolytes.
622. **ENGINEERING STATISTICAL THERMODYNAMICS I (3).** Pr., CHE 620. Fundamentals of statistical mechanics, partition functions, chemical equilibrium.
623. **ENGINEERING STATISTICAL THERMODYNAMICS II (3).** Pr., CHE 622. Applications of molecular theory and models to the properties of real gases and liquids.
625. **REACTION ENGINEERING I (3).** Pr., CHE 610. Analysis and design of chemical reactors.
626. **REACTION ENGINEERING II (3).** Pr., CHE 625. A continuation of CHE 625.
627. **HETEROGENEOUS CATALYSIS (3).** Pr., COI, graduate standing. Surface reactions, catalytic processes, catalyst characterization methods.
630. **PROCESS DYNAMICS AND CONTROL I (3).** Coreq., CHE 600. Advanced linear control system analysis and an introduction to nonlinear systems.
631. **PROCESS DYNAMICS AND CONTROL II (3).** Pr., CHE 630. An introduction to modern control theory with emphasis on chemical reactors and stagewise processes.
632. **PROCESS MODELING AND SIMULATION (3).** Pr., CHE 600. Mathematical modeling of chemical process systems, process simulation with digital simulation languages.
633. **OPTIMIZATION (3).** Pr., COI. Analytical and numerical optimization techniques. Maxima and minima of functions of several variables, constraints, linear and non-linear programming methods.
640. **DISTILLATION (3).** Pr., COI, graduate standing. Design principles for multicomponent, extractive, azeotropic, and other complex distillation processes.

- 641. **ABSORPTION AND EXTRACTION (3).** Pr., COI, graduate standing. Design principles for gas absorption and extraction processes.
- 642. **HEAT TRANSFER (3).** Pr., COI, graduate standing. Analysis and design principles for advanced heat transfer processes, special emphasis on two phase heat transfer in reaction systems, packed beds, and other process equipment.
- 645. **POLYMER ENGINEERING (3).** Pr., COI, graduate standing. Structure of polymers, molecular forces and properties, polymer formation and modification, kinetics of polymerization, polymer technology and applications.
- 646. **PROCESS ECONOMICS (3).** Pr., COI, graduate standing. Venture analysis, project justification, cost estimation, and project engineering.
- 647. **CHEMICAL-PHYSICAL TREATMENT OF WASTE WATER (3).** Pr., CHE 326, 363. Principles of chemical oxidation, adsorption, flocculation and coagulation, and ion exchange as applied to the treatment of waste water.
- 650. **SPECIAL TOPICS IN CHEMICAL ENGINEERING. (CREDIT TO BE ARRANGED.)** Pr., COI, departmental approval. May be taken more than one quarter.
- 670. **SEMINAR (1).** Pr., graduate standing. May be taken up to three quarters for credit.
- 690. **DIRECTED READING IN CHEMICAL ENGINEERING. (CREDIT TO BE ARRANGED.)** Pr., departmental approval. May be taken more than one quarter.
- 699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
- 799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Chemistry (CH)

Professors Baker, Colburn, Friedman, Hargis, Hill, Melius,
Shevlin, Ward, and Worley
Adjunct Professor McAuliffe

Associate Professors Greene, *Acting Head*, Aull, Dinius, Johnson,
Kohl, Livant, Neely, Perry, and Webb

Assistant Professors Bizzigotti, Donnelly, Illies, Mattson,
McKee, Mountcastle, and Parish

Adjunct Assistant Professor Estridge

Adjunct Instructors Childers, Johnson, and Reynolds

Chemistry Laboratory fee per course per quarter is \$20.00. This additional fee which applies to CH 103L, 104L, 105L, 111L, 112L, 113L, 207L, and 208L is to be paid at the time the student picks up the locker key at the Scientific Supply Store before the first meeting day of lab. After the tenth day of classes each quarter a Late Fee of \$10.00 in addition to the \$20.00 Laboratory Fee will be assessed. The Laboratory Fee is not refundable after the tenth class day.

- 101. **INTRODUCTORY CHEMISTRY I (2).** LEC. 3. Pr. or Coreq., MH 140, 160, or 161. To acquaint science students with the classifications of matter and the manner in which the chemist identifies matter and records the nature of its changes. Atomic structure, chemical bonding, molecular aggregations and the laws summarizing the properties and nature of the physical states of matter are considered.
- 102. **INTRODUCTORY CHEMISTRY II (2).** LEC. 3. Pr., CH 101, Coreq., CH 103L. A continuation of the topics described under CH 101.
- 103. **FUNDAMENTALS OF CHEMISTRY I (4).** LEC. 4. Pr., high school chemistry, Coreq., MH 160 or 161; CH 103L. Encompasses the subject matter of CH 101 and 102 for the superior student with adequate background preparation. Departmental approval is required for admission to this course.
- 103L. **GENERAL CHEMISTRY LABORATORY (1).** LAB. 3. Coreq., CH 102 or 103. The basic laboratory techniques to experimental measurements, and to the interpretation of data.
- 104. **FUNDAMENTALS OF CHEMISTRY II (4).** LEC. 4. Pr., CH 103 or 102. Coreq., CH 104L. A continuation of CH 102 or CH 103. The methods of preparation and the reactions of individual as well as classes of chemical compounds are used to study and illustrate the mechanism and dynamics of chemical change.
- 104L. **GENERAL CHEMISTRY LABORATORY (1).** LAB. 3. Pr., CH 103L, Coreq., CH 104. A continuation of CH 103L.
- 105. **FUNDAMENTALS OF CHEMISTRY III (4).** LEC. 4. Pr., CH 104, Coreq., CH 105L. Solution chemistry including various ionic equilibria, coordination compounds, acid-base phenomena and redox processes. Quantitative analytical problem-solving will be emphasized.
- 105L. **GENERAL CHEMISTRY LABORATORY (1).** LAB. 3. Coreq., CH 105. A continuation of CH 103L and CH 104L.
- 111. **GENERAL CHEMISTRY (4).** Coreq., MH 160 or 140, or 161. Also 111L. For chemistry majors and others in closely related areas. Credit in CH 101, 102 or 103 precludes credit for this course.

- 111L. **GENERAL CHEMISTRY LABORATORY (1). LAB. 3.** Coreq. CH 111. The basic laboratory techniques to experimental measurements and to the interpretation of data.
112. **GENERAL CHEMISTRY (4).** Pr., CH 111 or 103. Coreq. 112L. Continuation of CH 111. Credit in CH 104 precludes credit for this course.
- 112L. **GENERAL CHEMISTRY LABORATORY (1). LAB. 3.** Pr., 111L. Coreq. CH 112. A continuation of CH 111L.
113. **GENERAL CHEMISTRY (4).** Pr., CH 112. Coreq. 113L. Continuation of CH 112. Credit in CH 105 precludes credit for this course.
- 113L. **GENERAL CHEMISTRY LABORATORY (1). LAB. 3.** Pr., 112L. Coreq. CH 113. A continuation of CH 112L.
201. **DESCRIPTIVE CHEMICAL SCIENCE (5). LEC. 5.** Pr., MH 140. To foster in the non-science student an appreciation for the chemical nature of the material universe and the contribution of chemistry to his cultural heritage. This course will not serve as a prerequisite for any other chemistry course.
203. **ORGANIC CHEMISTRY (5).** Pr., CH 104. Fundamentals of organic chemistry. Designed for students in Home Economics, and others.
204. **ANALYTICAL CHEMISTRY (3). LEC. 3. EACH QUARTER.** Pr., CH 105 and 105L or 113. Theory and application of gravimetric, volumetric, and colorimetric chemical analysis.
- 204L. **ANALYTICAL CHEMISTRY LABORATORY (2). LAB. 8. EACH QUARTER.** Pr., or Coreq., CH 204. Analytical techniques applied to the analysis of ores and minerals.
205. **ANALYTICAL CHEMISTRY (5). LEC. 3, LAB. 6.** Pr., CH 113 or 204. Fundamental concepts used in analytical chemistry and observed in the laboratory via gravimetric analysis and separation techniques.
207. **ORGANIC CHEMISTRY (4). LEC. 4.** Pr., CH 104. This course together with CH 208 meets the needs of students in Laboratory Technology, Pre-Medicine, Pre-Dentistry, Pre-Veterinary Medicine, Pre-Pharmacy, and in other biological sciences.
- 207L. **ORGANIC CHEMISTRY LABORATORY (1). LAB. 3.** Pr., or Coreq., CH 207.
208. **ORGANIC CHEMISTRY (3). LEC. 3.** Pr., CH 207 and 207L. Continuation of CH 207.
- 208L. **ORGANIC CHEMISTRY LABORATORY (2). LAB. 6.** Pr., or Coreq., CH 208.
209. **ORGANIC CHEMISTRY (5). LEC. 5.** Pr., CH 208. A continuation of CH 208 with emphasis on those organic compounds considered to be the most important to the understanding of biochemistry, i.e., polyfunctional compounds, carbohydrates, lipids, amino acids, proteins, and heterocyclic compounds.
301. **BIOCHEMISTRY (5).** Pr., CH 208. Especially designed for students in Pharmacy. Credit in CH 518 precludes credit for this course.
302. **BIOCHEMISTRY (5).** Pr., CH 301. Continuation of CH 301. Credit in CH 519 precludes credit for this course.
303. **ORGANIC CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 113. Organic chemistry covering nomenclature, group reactions, important theories and concepts relating to aliphatic and aromatic compounds, designed primarily for chemistry majors.
304. **ORGANIC CHEMISTRY (5). LEC. 3, LAB. 6.** Pr., CH 303. Continuation and extension of CH 303.
305. **ORGANIC CHEMISTRY (5). LEC. 3, LAB. 6.** Pr., CH 304. Continuation and extension of CH 303-304, including heterocyclic compounds and many classes of compounds of interest in the field of biochemistry. The laboratory portion of the course will deal primarily with organic qualitative analysis.
316. **PHYSICAL CHEMISTRY (5).** Pr., MH 140 or 160. CH 105 and PS 205. A one-quarter course for pre-medicine students.
470. **HONORS THESIS (3-6).** Pr., Enrollment in the University Honors Program. May be repeated once for a maximum of 6 hours credit.
490. **SPECIAL PROBLEMS IN CHEMISTRY (5). LAB. 15.** Pr., COI, senior standing. Not open to graduate students. An individual problem course. Each student will work under the direction of a staff member on some problem of mutual interest. May be repeated for a maximum of 15 credit hours.

ADVANCED UNDERGRADUATE AND GRADUATE

504. **INTRODUCTION TO MOLECULAR ORBITAL METHODS (5).** Pr., CH 305 and 508 or equivalent. Elementary quantum mechanics, Huckel molecular orbital theory, SCF molecular orbital procedures, orbital symmetry problems, and applications of the various theoretical procedures to organic chemistry.
507. **PHYSICAL CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 104 or 112; MH 264; PS 221 or 206. A discussion of the more important theories and laws of physical chemistry.
508. **PHYSICAL CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 507. Continuation of CH 507.
509. **PHYSICAL CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 508. An extension of principles in CH 507-508 with special reference to modern theories of the structure of matter.
510. **INTERMEDIATE INORGANIC CHEMISTRY I (5). LEC. 5.** Pr., CH 508. Atomic structures, valence bonding, and periodic properties of the elements.
511. **INTERMEDIATE INORGANIC CHEMISTRY II (5). LEC. 3, LAB. 6.** Pr., CH 510. Synthesis and purification of typical inorganic compounds.

512. **CHEMICAL THERMODYNAMICS** (5). Pr., CH 508. Basic laws governing changes in energy in gases, liquids, and solids.
513. **ANALYTICAL CHEMISTRY** (5). LEC. 3, LAB. 6. Pr., CH 507. Fundamental concepts used in instrumental analytical chemistry and as observed in the laboratory via spectrophotometric, electroanalytical, and chromatographic techniques.
515. **POLYMER TECHNOLOGY I** (4). LEC. 3, LAB. 3. Pr., CH 304 or CHE 560. Important aspects of polymer science, connection between chemical structure and important properties of modern plastics and synthetic structural materials, the common methods of fabrication of these into articles and the basic chemistry behind their manufacture.
516. **POLYMER TECHNOLOGY II** (3). LEC. 3. Pr., CH 515 or TE 424. Continuation of CH 515. Study of polymerization and condensation polymers. Modes of fabrication, special use selection requirements, and study of a number of commercially available materials and their areas of use.
518. **BIOCHEMISTRY** (5). LEC. 4, LAB. 3. Pr., CH 204, 204L, 208. Classification, structure and chemistry of the major chemical constituents of living matter. (Same course as ADS 518.)
519. **BIOCHEMISTRY** (5). LEC. 4, LAB. 3. Pr., CH 518 or its equivalent. Introduction to metabolism. (Same course as ADS 519.)
520. **CLINICAL BIOCHEMISTRY** (5). LEC. 3, LAB. 6. Pr., CH 302 or CH 519 or its equivalent. Principles of clinical chemical analysis.
530. **ADVANCED GENERAL CHEMISTRY** (5). LEC. 4, LAB. 3. Pr., CH 207 or COI, junior standing. An index of chemistry topics that are traditionally included in high school chemistry. Not available for credit to students in the areas of Science, Mathematics, or Engineering.

GRADUATE

610. **ADVANCED INORGANIC CHEMISTRY** (5). Pr., CH 510 or equivalent. Selected groups of inorganic compounds are considered from a modern physicochemical viewpoint; thus emphasizing their chemical and physical properties, their rates of conversion one into another, their molecular structure, and valence relationships.
611. **PHYSICAL METHODS IN INORGANIC CHEMISTRY** (5). Pr., CH 610 or equivalent. The theory and applications of modern techniques for structural and bonding information in inorganic chemistry. NMR, IR, Raman, NQR, mass spectroscopy, electronic spectra, ESR, and other techniques will be discussed.
612. **ORGANO-METALLIC CHEMISTRY** (5). Pr., CH 610 or equivalent. General organo-metallic chemistry with an emphasis on recent developments.
614. **THE CHEMISTRY OF COORDINATION COMPOUNDS** (5). Pr., CH 510 or equivalent. Complex inorganic compounds with emphasis on early and modern developments, isomerism, chelation, and methods of determining formation constants.
616. **ADVANCED TOPICS IN INORGANIC CHEMISTRY** (5). Pr., CH 610 or equivalent. Includes the most active research areas of modern inorganic chemistry.
620. **ADVANCED ORGANIC CHEMISTRY I** (5). LEC. 5. Pr., CH 305 or equivalent. Organic reaction mechanisms, free radicals, carbonium ions, carbanions, carbenes, etc.
621. **ADVANCED ORGANIC CHEMISTRY II** (5). LEC. 5. Pr., CH 620. Physical organic chemistry with emphasis on the interpretation of organic reaction mechanisms.
622. **ADVANCED ORGANIC CHEMISTRY III** (5). LEC. 5. Pr., CH 620. Current synthetic methods of organic chemistry.
623. **HETEROCYCLIC COMPOUNDS** (5). Pr., CH 621 or equivalent. Organic compounds containing heterocyclic ring systems.
624. **ELEMENT-ORGANIC COMPOUNDS** (5). Pr., CH 621 or equivalent. Organic chemistry of Groups III, IV and V elements.
625. **ORGANIC NITROGEN COMPOUNDS** (5). Pr., CH 621 or equivalent. Organic compounds containing nitrogen.
627. **SPECIAL TOPICS IN ORGANIC CHEMISTRY** (5). Pr., CH 621 or equivalent. A selection of modern topics in organic chemistry.
628. **INTRODUCTION TO THEORETICAL ORGANIC CHEMISTRY** (5). Pr., CH 621 or equivalent. Topics generally considered include molecular structure; chemical reactions and energy change; structure-reactivity relationships; dipole moments and carbonium, olefinic and free-radical stability; and organic chemical spectroscopy.
- 630-631. **ADVANCED PHYSICAL CHEMISTRY** (5-5). Pr., CH 509. CH 630 is pr. for CH 631. Topics generally considered include kinetic theory of matter, modern theories of the structure of matter, generalized thermodynamics, relation of molecular structure to spectroscopic and thermodynamic properties, and kinetics of chemical reactions.
632. **RELATION BETWEEN STRUCTURE AND PROPERTIES OF CHEMICAL SUBSTANCES** (5). Pr., CH 631. Established relationships that exist between structures of organic and inorganic compounds and physical properties which are relatively easy to determine. The principal aim is the demonstration of the fundamental relation of structure compounds and electronic configurations.
633. **CHEMICAL KINETICS** (5). Pr., CH 631. The mathematics and characterization of chemically reacting systems includes discussions of the collision theory, the transition state theory, unimolecular reactions in condensed phases, behavior of nonstationary-state systems, and photochemistry.
634. **HETEROGENEOUS EQUILIBRIA** (5). Pr., CH 631. Chemical and physical equilibria in heterogeneous systems.

636. **STATISTICAL THERMODYNAMICS** (5). Pr., CH 631. Statistical approach to thermodynamics and chemical equilibrium.
637. **INTRODUCTION TO QUANTUM CHEMISTRY** (5). Pr., CH 631. Quantum theory as applied to chemical problems.
638. **MOLECULAR SPECTROSCOPY** (5). Pr., CH 631. Theory and application of optical and magnetic resonance spectroscopy.
640. **CARBOHYDRATES** (5). Pr., CH 518 or equivalent. The chemistry of the mono- and polysaccharides.
641. **PROTEINS** (5). Pr., CH 507 and CH 519 or equivalent. Chemical and physical properties of amino acids and proteins, protein structure and the relation of protein structure to function.
642. **LIPIDS** (5). Pr., CH 519 or equivalent. Chemistry of the lipids and their biological significance.
643. **ENZYMES** (5). Pr., CH 519 or equivalent. The principles of enzyme chemistry including the physical, chemical and catalytic properties of enzymes.
644. **TOPICS IN BIOCHEMISTRY** (1-10). Pr., CH 519 or equivalent and COI. Advanced selected areas of metabolism and the techniques for characterization of macromolecules.
645. **BIOCHEMICAL RESEARCH TECHNIQUES** (5). Pr., CH 519 or equivalent. Modern biochemical laboratory techniques.
646. **PHYSICAL BIOCHEMISTRY** (5). Pr., CH 305 and CH 509 or equivalent. The structure and properties of biological compounds (saccharides, lipids, amino acids, proteins, nucleic acids, and enzymes). The bioenergetics of the important metabolic pathways are investigated. Emphasis on structure of biological compounds and mechanisms of biological reactions.
650. **ANALYTICAL CHEMISTRY** (5). Pr., CH 513 or equivalent. Analytical principles, applications and methods, mathematical interpretations, and current developments.
651. **ANALYTICAL CHEMISTRY** (5). LEC. 4, LAB. 3. Pr., CH 513. Analytical application of chemical spectroscopy.
652. **THEORIES AND CURRENT TOPICS OF ANALYTICAL CHEMISTRY** (5). Pr., CH 651. Winter, odd years.
653. **PHYSIO-CHEMICAL SEPARATIONS** (5). LEC. 4, LAB. 3. Pr., CH 509. Spring, even years.
654. **RADIOCHEMICAL ANALYSIS** (5). LEC. 3, LAB. 6. Pr., CH 205. Summer, odd years. The application of radioactive tracers and related techniques to chemical analysis.
655. **CHEMICAL INSTRUMENTATION** (5). LEC. 5. Chemical transducers and conversion of the transducer output to some usable form.
670. **SEMINAR** (1). Each quarter except Summer. Required course for all graduate students in chemistry. May be repeated for a maximum of 10 credit hours.
691. **DIRECTED INDIVIDUAL STUDY IN CONTEMPORARY CHEMISTRY. (CREDIT TO BE ARRANGED.)** Pr., completion of 30 hours of graduate courses in chemistry. May be repeated for credit.

Civil Engineering (CE)

Professors Ramey, Head, and Molz

Associate Professors Bell, Benefield, Guven, Jenkins

Melville, Moore, Morgan, Stevens, Vecellio, and Yoo

Assistant Professors Culpepper, Parker, Shoemaker, Springfield, and Telesco

General Curriculum (GC) students (those with undeclared majors) may enroll only with departmental consent.

200. **CE SEMINAR** (1). Pr., sophomore standing in CE or COI. Civil engineering perspectives and work, curriculum, and student activities and opportunities. Discussion of construction, environmental, geotechnical, hydraulic, structures, and transportation engineering and undergraduate and graduate specialty areas in CE at Auburn.
201. **SURVEYING** (5). LEC. 4, LAB. 3. Pr., CE 202 or concurrently. Data collection and analysis emphasized. Analysis of errors; simple curves, vertical curves, spirals; topographic mapping and land surveying.
202. **INTRODUCTION TO COMPUTER METHODS IN CIVIL ENGINEERING** (4). LEC. 3, LAB. 2. Pr., MH 264 or concurrently. Introduction to electronic digital computer programming; machine solution of civil engineering problems; library programs.
205. **ENGINEERING MECHANICS — STATICS** (4). Pr., PS 220 or concurrently. Coreq., MH 264. Basic principles of statics. Free body concepts. Parallel, concurrent, and noncurrent force systems, coplanar and noncoplanar. Friction, Centroids, and moments of Inertia.
207. **MECHANICS OF SOLIDS** (4). LEC. 3, LAB. 3. Pr., CE 205, MH 264, Coreq., MH 269. Principles of strength of materials; equilibrium, compatibility, and properties of materials. Stress and strain at a point. Stress-strain-temperature relations. Simple application of stress and deformation analysis to axially and biaxially loaded structures as well as flexural and torsional loading.
301. **CIVIL ENGINEERING ANALYSIS** (3). Pr., MH 269, CE 202. Applications of calculus and ordinary differential equations, numerical methods, vector algebra and linear algebraic equations to Civil Engineering problems.

303. **CIVIL ENGINEERING STATISTICS (4).** Probability concepts, distributions, estimation, hypothesis testing, regression, analysis of variance, emphasis on civil engineering applications.
310. **HYDRAULICS I (3).** Pr., CE 301. Coreq., ME 301, ME 321. Fundamental concepts of fluid mechanics, hydrostatics, kinematics, ideal flow, viscous effects, transport phenomena, drag, laminar and turbulent flow in pipes and channels.
311. **HYDRAULICS II (3).** Pr., CE 310. Applications of fluid mechanics, pipe flow, fluid measurements, pipe networks, pumps, open channel, dimensional analysis and theory of modeling.
- 311L. **HYDRAULICS LABORATORY (1).** Coreq., CE 311. Laboratory experiments and demonstrations, pipe flow, pumps, open channels, gates, weirs, analysis and presentation of hydraulic data.
312. **HYDROLOGY (3).** Pr., CE 311, CE 303. Hydrologic cycle, precipitation, infiltration, runoff, unit hydrograph, rational method, evaporation, flood routing, ground water, frequency analysis, synthetic data generation.
321. **WATER AND WASTEWATER COLLECTION SYSTEMS (3).** Pr., CE 310. Theory and design of water collection and distribution facilities and waste collection systems.
350. **TRANSPORTATION ENGINEERING (3).** Pr., CE 201, junior standing. Transportation system characteristics; model functions; planning, design and operation of transportation facilities as related to civil engineering practice.
360. **THEORY OF STRUCTURES I (4).** Pr., CE 202, CE 207. Basic structural analysis of determinate structures. Deflection curves. Influence lines and their application on determinate structures.
362. **THEORY OF STRUCTURES II (3).** Pr., CE 360. Structural analysis of indeterminate structures using geometric and energy methods. Influence lines for indeterminate structures. Approximate Methods.
364. **THEORY OF STRUCTURES III (3).** Pr., CE 362. Introduction to basic stiffness, flexibility and direct stiffness methods of analysis. Development of computer programs to execute direct stiffness analysis of structural systems.
400. **ADVANCED SURVEYING AND MAPPING (5).** LEC. 4, LAB. 3. Pr., junior standing. Programming principles and measuring are emphasized. Selected topics from map projections, electronic and special instruments; geodesy.
416. **SUBSURFACE HYDROLOGY (3).** Pr., CE 311. Soil moisture and groundwater, geology of groundwater, principles of groundwater flow, regional flow systems, flow to wells.
420. **WATER TREATMENT (4).** Pr., CE 321. Theory, design, construction and operation of water treatment facilities considered on a unit operation and process basis.
421. **WASTEWATER TREATMENT (4).** LEC. 3, LAB. 3. Coreq., CE 420. Biological processes for wastewater treatment.
422. **ENVIRONMENTAL ENGINEERING DESIGN I (3).** Pr., CE 421. Process design of environmental engineering systems.
423. **ENVIRONMENTAL ENGINEERING DESIGN II (3).** Pr., CE 421. Hydraulic design of environmental engineering systems.
428. **RADIOLOGICAL HEALTH ENGINEERING (3).** Pr., senior standing. Sources and properties of radiation, ionizing effects, biological effects, dosimetry, detection and measurement, design of radiation shielding, decontamination, disposal of wastes, legal aspects of radiation control, public attitudes.
430. **INTRODUCTION TO SOIL MECHANICS (5).** LEC. 4, LAB. 3. Pr., CE 301, GL 315. Physical properties of soils; subsurface investigations; clay mineralogy; soil classification; concept of effective stress; consolidation theory; time-settlement analyses; soil compaction, and shear strength.
431. **SOIL AND FOUNDATION ENGINEERING (3).** Pr., CE 362, 430, junior standing. Slope stability; vertical and lateral soil pressures; bearing capacity; foundations.
440. **CONTRACTS AND SPECIFICATIONS (3).** Pr., CE 460, senior standing. Legal and technical principles of construction contract documents. Drawings, plans and specifications, contract law, professional liability and ethics.
450. **TRAFFIC ENGINEERING FUNDAMENTALS (3).** Pr., CE 350. The fundamental elements of traffic engineering including traffic studies, traffic operations, and traffic control devices.
452. **AIRPORT DESIGN (4).** Pr., CE 350 or COI. An analysis of the elements affecting the design of airports including runway configuration, capacity analyses, geometric design of runways and taxiways, pavement design and air-field drainage.
454. **HIGHWAY ENGINEERING (3).** Pr., CE 350, IE 327. Planning and development of highway projects; preparation of project plans; earthwork; pavement and drainage design; construction and maintenance practices.
460. **REINFORCED CONCRETE DESIGN I (3).** Pr., CE 362. Concrete properties. Design synthesis and analysis of reinforced concrete beams, slabs, and columns. Reinforcement detail.
465. **STEEL DESIGN (3).** Pr., CE 362. Steel properties. Design synthesis and analysis of steel members in tension, compression, shear and flexure. Structural fasteners.
479. **HONORS THESIS (3-6).** Pr., COI and department head approval. Individual student endeavor consisting of directed research and writing of honors thesis. (CE Honors Program students only. May be repeated once for a maximum of 6 total credit hours.)
490. **SPECIAL PROBLEMS. (CREDIT 1-5).** Pr., COI and department head approval. Individual student endeavor under staff supervision involving special problems of an advanced nature in civil engineering.

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ADVANCED UNDERGRADUATE AND GRADUATE

511. **FLOW IN OPEN CHANNELS (3).** Pr., CE 311. Fundamental concepts, uniform flow, rapidly varied flow, gradually varied flow, subcritical and supercritical flow, water surface profiles, energy dissipation, introduction to transient phenomena.
512. **STATISTICAL METHODS IN HYDROLOGY (3).** Pr., CE 312, 303. Stochastic hydrologic processes, statistical analysis of data, time series analysis, correlation and regression analysis, frequency distributions, stochastic hydrologic models.
513. **COASTAL ENGINEERING (3).** Pr., CE 311. Basic wave theory, diffraction, reflection, refraction, wind waves generation, wave effects on structures and sediments.
514. **SEDIMENT TRANSPORT (3).** Pr., CE 311, 511, or COI. Sediment properties, incipient motion, bed forms, bends and meanders, sediment discharge, stable channel design, erosion and deposition, sediment transport in pipes.
516. **GROUNDWATER HYDRAULICS (3).** Pr., CE 311, CE 416 or COI. Darcy's Law, aquifers, well flow, dispersion, infiltration, seawater intrusion.
517. **WATER RESOURCES ENGINEERING (3).** Pr., CE 311, 312. Uses and sources of water; economic, hydrologic, hydraulic, environmental and legal aspects of design and operation of water-resource systems; multi-purpose projects; irrigation, hydroelectric power generation and flood control.
520. **ENVIRONMENTAL ENGINEERING CHEMISTRY I (3).** LEC. 2, LAB. 3. Pr., COI. The physical, chemical, and biological aspects of environmental engineering; laboratory testing procedures and experiments relating to the treatment of waters and wastes.
521. **ENVIRONMENTAL ENGINEERING CHEMISTRY II (3).** LEC. 2, LAB. 3. Pr., CE 520. Numerical and graphical techniques associated with physical, chemical, and biological aspects of environmental engineering, laboratory testing procedures as well as computer applications of test results.
524. **AIR POLLUTION (5).** Pr., COI, senior standing. The nature, sources and effects of polluting materials including gases, dusts, vapors and fumes and the relations of atmospheric conditions to their dispersal. Introduction to theory and design of air pollution control devices and sampling programs. Legal aspects of air pollution.
527. **FUNDAMENTALS OF WATER SUPPLY AND WASTE TREATMENT (5).** Pr., COI, senior standing. (Not for credit for civil engineering students.) The principles of water supply and waste disposal and the chemistry and biology of water and waste treatment will be presented. Alternatives in water supply and waste disposal will be considered and the theory of treatment operations will be discussed. Laboratory exercises will be conducted.
528. **FUNDAMENTALS OF ADVANCED WATER AND WASTEWATER TREATMENT (3).** Pr., CE 420, CE 421. (Not for graduate credit for civil engineering students.) The principles of various methodologies for advanced water and wastewater treatment will be discussed. Economic trade-offs and process selection will be emphasized.
530. **SHALLOW FOUNDATION DESIGN (3).** Pr., CE 431, 460. Design of spread footings, combined footings, mat foundations, rigid and flexible retaining walls.
531. **DEEP FOUNDATION DESIGN (3).** Pr., CE 431. Single piles, vertical and lateral loads, pile installation, pile groups, field load tests, drilled shafts, and caissons. Design and construction methods.
535. **SOIL STABILIZATION (3).** Pr., CE 430, or equivalent; CE 303, junior standing. Methods of stabilizing soft soil; consolidation, compaction with the use of lime, cement and other additives; construction operations, costs, and field control related to soil stabilization.
536. **PAVEMENT MATERIAL CHARACTERIZATION (3).** LEC. 2, LAB. 3. Pr., 430. Properties of subgrade soils, granular bases, stabilized soils and bases, bituminous concrete, and portland cement concrete; laboratory testing techniques.
537. **PAVEMENT DESIGN (4).** LEC. 3, LAB. 3. Pr., CE 350, CE 430. Material characterization, pavement response models, pavement performance models, structural design systems.
542. **CONSTRUCTION MANAGEMENT (3).** Pr., senior standing. Project planning and scheduling, estimating and bidding, labor law, labor productivity, project safety.
544. **CONSTRUCTION EQUIPMENT AND METHODS (3).** Pr., senior standing. Selection of equipment for heavy construction operations; Production rates, owning and operating costs, optimizing equipment mix. Construction methods; formwork, compressed air and dewatering systems, blasting.
545. **MICROCOMPUTER APPLICATIONS IN CONSTRUCTION (3).** Pr., senior standing. Computer terminology, number systems, boolean algebra, structured programming of construction engineering and management problems, introduction to packaged software.
550. **TRAFFIC ENGINEERING ANALYSIS (3).** Pr., CE 350, 303. The theory and practice of traffic engineering including fundamental elements, studies and analysis, standards, and control measures.
551. **TRAFFIC CONTROL SYSTEMS DESIGN (4).** Pr., CE 350. Fundamental design concepts for highway traffic control systems. Topics include control requirements and warrants; hardware operation and equipment selection; development and implementation of timing plans for isolated intersections and intersection networks.
553. **GEOMETRIC DESIGN (4).** Pr., CE 350. An analysis of the elements affecting the location and design of rural highways, urban highways and arterial streets including design controls and criteria, cross-section elements, intersection design, interchange design, and social and environmental considerations.
554. **FREEWAY DESIGN AND OPERATIONS (3).** Pr., CE 350. Planning, design and operation of urban freeways and expressways, and rural interstate facilities. Topics include project planning and development; design concepts and criteria; interchange and ramp design; capacity analysis; freeway operations; surveillance and control systems.

556. **TRANSPORTATION PLANNING (3).** Pr., CE 350 or COI. The planning process for urban and regional transportation development. Topics include planning objectives and data requirements; planning inventories; modeling of trip-making behavior; development and evaluation of alternative plans; transportation system management concepts.
558. **RAILWAY ENGINEERING (3).** Pr., CE 350. Fundamental elements affecting the planning, design and operations of rail systems.
560. **REINFORCED CONCRETE DESIGN II (3).** Pr., CE 460. Coreq., CE 364. Building assemblages. USD for beams, T-beams; doubly reinforced beams; long columns and beam-columns; one way and two way slabs; footings; retaining walls. Interpretation of codes. Serviceability check.
562. **PRESTRESSED CONCRETE DESIGN (3).** Pr., CE 460. Properties and behavior of prestressed concrete. Prestressing systems and end anchorages. Loss of prestress. Analysis and design of beams for flexure. Camber, deflection, and cable layout.
565. **STEEL DESIGN II (3).** Pr., CE 465. Coreq., 364. Structural assemblages. Interpretation of codes; analytical verification of lateral-torsional and local buckling equations. Design of beam-columns, fasteners and building connections. Plate girders. Plastic design of continuous beams and frames.
567. **COMPUTER METHODS IN STRUCTURAL ENGINEERING (3).** Pr., CE 364. Principles of matrix formulations of structural problems; force and displacement methods. Algorithms for computer programs for analysis of trusses, beams, and frames. Use of computer programs, practical applications.
569. **TIMBER DESIGN (3).** Pr., CE 362. Properties and behavior of timber and plywood. Design of timber beams, columns, floor and wall assembly, and wood formwork. Timber trusses and laminated arches.
582. **OPTIMIZATION METHODS (3).** Pr., CE 301. Applications of calculus, linear programming and dynamic programming to civil engineering systems.
583. **SIMULATION METHODS (3).** Pr., CE 303. Monte Carlo methods; continuous variable simulations, applications of discrete variable simulation languages to civil engineering systems.

GRADUATE

613. **NUMERICAL METHODS IN HYDRAULICS AND HYDROLOGY (3).** Pr., CE 311, MH 362, MH 560, or COI. Derivation of basic surface and subsurface flow equations, numerical modeling methods, selected problems.
614. **ENVIRONMENTAL DISPERSION PROCESSES (3).** Pr., CE 511, MH 362, or COI. Introduction to theories of turbulent diffusion in the atmospheric and water environment; analytical, numerical and empirical solutions of selected problems in air and surface-water pollution; applications to design of stacks, ocean outfalls, and diffusers.
615. **POROUS MEDIA HYDRODYNAMICS (3).** Pr., CE 516, 613, MH 503, or COI. Fluid flow in porous media, potential flow theory, confined and unconfined flow, well flow, dispersion, hydrothermal problems, modeling.
616. **HYDRAULIC ANALYSIS OF UNSTEADY FLOW (3).** Pr., CE 511, MH 362, or COI. Introduction to transient problems, pipeline transients, open channel transients, analytical and numerical modeling.
617. **WATER RESOURCES SYSTEMS ENGINEERING I (3).** Pr., CE 583 or COI. Applications of systems methodology to hydrology, reservoir operation, flood forecasting, flood routing.
618. **WATER RESOURCES SYSTEMS ENGINEERING II (3).** Pr., CE 617. Simulation, linear, and dynamic programming applied to pipe and open/channel networks in water supply and water treatment systems.
619. **WATER RESOURCES SYSTEMS ENGINEERING III (3).** Pr., CE 618. Water quality forecasting and multipurpose river basin development, study of current literature.
620. **UNIT OPERATIONS IN WATER AND WASTE TREATMENT (3).** Pr., COI. The theory of various unit operations is developed and the application of these operations to water and wastewater treatment is considered.
621. **UNIT PROCESSES IN WATER AND WASTE TREATMENT I (3).** Pr., COI. Alkalinity, acidity, corrosion, chemical precipitation and coagulation are discussed.
622. **BIOLOGICAL WASTE TREATMENT (5).** Pr., COI. Development and application of the theories of biological waste treatment.
623. **UNIT PROCESSES IN WATER AND WASTE TREATMENT II (3).** Pr., COI. Ion exchange, adsorption, disinfection and gas transfer are discussed.
627. **ENVIRONMENTAL ENGINEERING CHEMISTRY III (3).** LEC. 2, LAB. 3. The chemistry of natural systems including: equilibrium chemistry, buffer systems in natural water, thermodynamics, and surface chemistry.
628. **STREAM SANITATION (5).** COI. Physical, chemical, biological and hydrological considerations relating to the degradation and self-purification of streams and estuaries. Water uses and water quality goals, objectives, and criteria. Principles of water quality modeling and waste-load allocation. Field studies will be performed.
629. **ADVANCED WASTE TREATMENT (3).** Pr., COI. Nitrogen and phosphorus removal techniques will be stressed. Other advanced waste treatment topics will be discussed.
631. **ADVANCED SOIL MECHANICS (5).** LEC. 4, LAB. 3. Pr., CE 431 or equivalent. Stress-strain characteristics of soils, stress distribution in soil media, consolidation, shear strength, and bearing capacity, with application to analysis and design of spread footings, rafts, and deep foundations; case studies.
633. **SEEPAGE, DRAINAGE, AND FLOW NETS (5).** Pr., CE 431 or equivalent. Darcy's Law, flow net construction, confined and unconfined flow systems, isotropic and anisotropic permeability, zoned embankments, soil filter design, drainage systems.

634. **SOIL STABILITY PROBLEMS (5).** Pr., CE 431 or equivalent. Retaining structures including cofferdams, bulkheads, and retaining walls; stability of natural and cut slopes, embankments, earth dam design; methods of field measurements; case studies.
635. **SOIL DYNAMICS (5).** Pr., CE 431 or equivalent, CE 667 or equivalent. Wave propagations in soils, lumped systems as applied to soil-structure systems, soil properties for dynamic loading conditions; earthquakes, oscillations, and blast loading conditions; analysis and design.
640. **CONSTRUCTION CONTRACTS (3).** Pr., CE 540. Format and content of construction contracts and specifications; legal principles of construction law; review of case histories and court decisions.
641. **CONSTRUCTION PLANNING AND CONTROL (3).** Pr., CE 542. Advanced concepts of planning, scheduling, and resource leveling; project cost accounting; labor productivity and motivation.
642. **ESTIMATING AND BIDDING (3).** Pr., CE 542. Preliminary and definitive estimates; cash flow analysis; unbalanced bids, bidding strategies; bidding models.
643. **CONSTRUCTION MATERIALS AND FORMING METHODS (3).** Construction material properties, specifications and testing; earthwork and compaction; material handling and transportation; formwork design and erection.
644. **ADVANCED CONSTRUCTION EQUIPMENT AND METHODS (3).** Engineering principles of equipment selection and performance for heavy construction; pile driving; tunneling and blasting; paving; equipment inventory and replace models.
645. **CONSTRUCTION APPLICATIONS OF OPERATIONS RESEARCH (3).** Pr., CE 582. Applications of linear programming, dynamic programming and simulation to construction operations and policy decisions.
650. **TRAFFIC FLOW THEORY (3).** Pr., CE 550 or COI. A study of the basic phenomena underlying traffic stream movement and individual vehicle behavior. Topics include flow parameters and relationships; microscopic and macroscopic flow models; equations of motion and state; continuity; single and multi-regime flow models.
651. **TRANSPORTATION SYSTEM ANALYSIS (3).** Pr., COI. Advanced operations research methods applied to transportation problems including regression/correlation analysis, queueing theory, simulation, and stochastic processes.
652. **MASS TRANSPORTATION SYSTEMS (3).** Pr., CE 611 or equivalent. Mass transportation technology and characteristics; planning for mass transit; travel demand models; innovative technologies.
653. **AIR TRANSPORTATION MODELING AND OPERATIONS (3).** Pr., CE 452, 651. The development and analysis of air transportation models for airport demand, forecasting and operations.
654. **TRANSPORTATION SAFETY (3).** Pr., CE 550 or COI. A study of transportation safety problems and the engineer's role in developing and administering safety programs. Topics include accident investigation and reconstruction; analysis of accident data; development and evaluation of accident countermeasures and safety programs.
656. **COMPUTER METHODS FOR TRANSPORTATION PLANNING (3).** Pr., CE 556. The structure and operation of computer algorithms applicable to urban transportation planning. Course emphasis on software for modeling trip-making behavior and database management.
657. **TRANSPORTATION PLANNING MODELS (3).** Pr., CE 556. An extension of the basic transportation planning process to include the theory of travel demand modeling and contemporary developments in the field. Course topics will include both aggregate and disaggregate behavioral models.
659. **SPECIAL TOPICS IN TRANSPORTATION ENGINEERING.** Credit to be arranged. May be taken more than one quarter.
660. **ADVANCED STRESS ANALYSIS (3).** Response of structures to complex loadings and support conditions. Shear center, unsymmetrical bending, curved beams. Beams on elastic foundation. Torsion in structures.
661. **SPECIAL TOPICS IN STRUCTURAL DESIGN (3-5).** Topics and credit hours may vary; special topics for advanced study will be selected.
662. **EXPERIMENTAL TECHNIQUES IN STRUCTURAL ANALYSIS (3).** LEC. 2, LAB. 3. Basis stress-strain relationships. Techniques and instrumentation for structural testing. Mechanical and electrical strain gages. Brittle lacquer, photogrid and photoelastic methods.
663. **NUMERICAL TECHNIQUES IN STRUCTURAL ANALYSIS (3).** Numerical methods (finite differences, Runge-Kutta, etc.) of analysis for structural members with variable sections; stability, vibrations, eigenvalue and beam-column problems. Applications.
664. **STABILITY OF STRUCTURES I (3).** Stability theory and geometric instability of structures, elastic buckling of bars and frames. Beam-columns. Inelastic buckling.
665. **ADVANCED MATRIX ANALYSIS OF SKELETAL STRUCTURES (3).** Pr., CE 567 or COI. Analysis of 2D and 3D framed structures. Special topics include temperature variation, eigensolution and minimal potential energy formulations.
666. **FINITE ELEMENT METHODS IN STRUCTURAL MECHANICS I (3).** Pr., 567 or COI. Principles of finite element analysis. Variational principles. Displacement polynomial and shape function formulations. 1-D and 2-D elements. Computer program development and applications.
667. **STRUCTURAL DYNAMICS I (3).** Free and forced vibration of single degree of freedom systems. Identification of dynamic loads. Response Spectra.
668. **FATIGUE AND FRACTURE MECHANICS ANALYSIS (3).** Pr., CE 660. Theories of failure. Inelastic theory of structures. Yield line theory of slabs. Stress intensity factors. Fracture mechanics analysis and crack control. Fatigue of materials.

- 669. **ANALYSIS OF STRUCTURAL PLATE SYSTEMS (3).** Analysis of isotropic and anisotropic plates with various shapes and boundary conditions due to lateral and inplane loads. Large deflection considerations in design. Numerical techniques.
- 670. **ANALYSIS OF SHELL SYSTEMS (3).** Pr., CE 669. Analysis of isotropic shell systems. Shells of revolution, cylindrical shells. Membrane and bending theories of analysis.
- 671. **APPLIED ELASTICITY I (3).** Analysis of stress and strain. Generalized stress-strain relationships. Application to plane stress and plane strain.
- 672. **PLASTIC BEHAVIOR OF STRUCTURES (3).** Basic theory of plasticity. Plastic design procedures and code provisions in structural design.
- 673. **STABILITY OF STRUCTURES II (3).** Pr., CE 664. Torsional buckling and lateral-torsional buckling of beams. Buckling of plates and shells. Buckling of rings and arches.
- 674. **ADVANCED THEORY OF STRUCTURES (3).** Minimum energy principles. Space frame roofs and stagger truss building framing. Flexural members with varying moments of inertia. Arches and cables. Special topics.
- 675. **FINITE ELEMENT METHODS IN STRUCTURAL MECHANICS II (3).** Pr., CE 666. Axisymmetric elements and problems. Finite elements in three dimensions. Thermal stresses. Special elements. Nonlinear problems. Applications.
- 676. **STRUCTURAL DYNAMICS II (3).** Pr., CE 667. Multiple degree of freedom systems. Analysis of structures subject to blast loadings. Earthquake analysis. Responses of large structures to dynamic loads. Continuous systems.
- 690. **SEMINAR. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
- 691. **DIRECTED READING IN CIVIL ENGINEERING. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
- 699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
- 799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Communication Disorders (CD)

Professors Weidner, Head, Smith

Associate Professor Haynes

Assistant Professors Hawes, Moran, and Pindzola

Clinical Supervisors Boddie, Clark-Lewis and White

SPEECH PATHOLOGY

- 340. **THE SPEECH AND HEARING MECHANISM (5).** Anatomy and physiology of the speech and hearing mechanism.
- 341. **PHONETICS (3).** LEC. 2, LAB. 3. Principles of phonetics and their application to speech.
- 350. **INTRODUCTION TO SPEECH PATHOLOGY — AUDIOLOGY (5).** Survey of the field of speech pathology-audiology. Includes history of the profession, the inter-relatedness of the various pathologies, general principles of evaluation and therapy, and the profession itself.
- 450. **PRINCIPLES OF SPEECH-LANGUAGE PATHOLOGY (5).** Not open to students emphasizing or majoring in speech-language pathology and audiology. Basic principles underlying a speech-language pathology program in a school setting. Description and discussion of disorders of oral communication, the identification of such disorders, principles of management, and the role of the classroom teacher.
- 455. **INTRODUCTION TO CLINICAL PROCEDURES IN SPEECH PATHOLOGY (4).** Orientation to clinical activities, management methods and preparation of professional reports. Clinical observation required.
- 456. **CLINICAL PRACTICUM IN SPEECH-LANGUAGE PATHOLOGY (1).** Pr., CD 455 or equivalent. May be repeated for a maximum of 2 hours toward minimum degree requirements.

ADVANCED UNDERGRADUATE AND GRADUATE

- 551. **ARTICULATION DISORDERS (5).** Pr., CD 340, 341, or equivalent. Introduction to the principles of normal and deviant articulation acquisition.
- 552. **NORMAL AND DEVIANT LANGUAGE ACQUISITION IN CHILDREN (5).** Pr., CD 340, 341, or equivalent. Introduction to the principles of normal and deviant language acquisition.
- 553. **FLUENCY DISORDERS (5).** Pr., CD 340, 341, or equivalent. Introduction to the principles of fluent and disfluent verbal behavior.
- 554. **VOCAL DISORDERS (5).** Pr., CD 340, 341. Introduction to the principles of normal and deviant vocal behavior.
- 555. **NORMAL ASPECTS OF HUMAN VERBAL COMMUNICATION (5).** Pr., CD 340, 341, junior standing. Introduction to the normal processes of speech, language and hearing including: the physiological aspects of normal human speech communication, the hemispheric processing of language, the acoustical aspects of speech production and transmission, the psychoacoustic aspects of speech reception and the perceptual variables associated with linguistic behavior.

556. **COMMUNICATION DISORDERS IN THE AGING (4).** Not open to students majoring in speech-language pathology and audiology. Consideration of the normal communicative process and changes which may accompany the aging process. A basic study of the symptoms, causes, and treatment of hearing, speech and language disorders in the geriatric population.
557. **EVALUATION OF RESEARCH IN SPEECH PATHOLOGY AND AUDIOLOGY (5).** Pr., 551 or 552 or 553 or equivalent. A critical survey of common experimental designs and statistical procedures used in the speech-language pathology/audiology literature. The course is designed for consumers of research as opposed to researchers.

GRADUATE

607. **INDEPENDENT STUDY (1-5).** Prior written approval required. Conferences, readings, research, and reports. May be repeated for a maximum of 5 hours credit.
650. **CLINICAL PROBLEMS IN SPEECH (2).** Pr., CD 455-456 series or COI. Methods, techniques, and clinical management of the disorders of speech. Clinical practice required. May be repeated for credit.
651. **ARTICULATION DISORDERS (4).** Pr., CD 551 or COI. Empirical and theoretical bases for articulatory pathologies, diagnoses, and therapies.
652. **ASSESSMENT STRATEGIES IN CHILD LANGUAGE DISORDERS (4).** Pr., CD 552 or COI. Empirical and theoretical bases for evaluation of language-disordered children.
653. **FLUENCY DISORDERS (4).** Pr., CD 553 or COI. Empirical and theoretical bases for disfluency disorders, diagnoses, and therapies.
654. **VOICE DISORDERS (4).** Pr., CD 554 or COI. Empirical and theoretical bases for voice pathologies, diagnoses and therapies.
655. **LANGUAGE AND SPEECH DISORDERS IN ADULTS (4).** Pr., CD 552 or COI. Empirical and theoretical bases for speech/language disorders associated with CNS pathologies, diagnoses, and therapies.
656. **CLEFT PALATE (4).** Pr., CD 551 or COI. Empirical and theoretical bases for speech/language pathologies associated with cleft palate, diagnoses, and therapies.
657. **SEMINAR IN SPEECH PATHOLOGY. (CREDIT TO BE ARRANGED.)** Pr., CD 551, 552, 553, 554, or COI. Advanced treatment of contemporary topics and trends, as well as current research aspects of speech pathology. May be repeated for credit with change in topics.
658. **FIELD EXPERIENCE IN SPEECH PATHOLOGY (5-10).** S-U grading only. Full-time assignment in a speech and hearing facility, the choice being made from the following settings: university speech and hearing clinic, hospital, public school, and various community agencies serving speech- and hearing-impaired children and adults. May be repeated for a maximum of 10 hours credit. No more than 5 hours may be used for minimum requirements toward a master's degree.
659. **THE NEUROLOGICAL BASES OF COMMUNICATIVE DISORDERS (4).** Pr., graduate standing. Anatomy and physiology of the central nervous system as it relates to speech, language and hearing functions and disorders.
680. **EXPERIMENTAL PHONETICS (4).** Pr., CD 341 or equivalent. Orientation to acoustic and physiologic instrumentation used in the study of normal and disordered speech.
681. **MOTOR SPEECH DISORDERS (4).** Pr., CD 659 or COI. Empirical and theoretical bases for motor speech disorders, diagnoses, and therapies.
682. **TREATMENT STRATEGIES IN CHILD LANGUAGE DISORDERS (4).** Pr., CD 552 or equivalent. In-depth analysis of management procedures in child language disorders.
699. **THESIS. (CREDIT TO BE ARRANGED.)**

AUDIOLOGY

465. **INTRODUCTION TO CLINICAL PROCEDURES IN AUDIOLOGY (3).** Pr., CD 560 or equivalent. Audiological instrumentation and test procedures.
467. **ADVANCED AUDIOLOGICAL EVALUATION PROCEDURES (2).** Pr., CD 465 and 562 or equivalent. Procedures in masking and special testing.
560. **INTRODUCTION TO AUDIOLOGY (5).** Principles of auditory reception, the hearing mechanism and the problems involved in measuring, evaluating, and conserving hearing.
561. **HEARING PATHOLOGY (5).** Pr., CD 560 or equivalent. Evaluation and rehabilitation of aural handicapped children and adults; hearing aids and hearing training. Clinical practice.
562. **HEARING EVALUATION, REHABILITATION AND CONSERVATION (5).** Pr., CD 561 or COI. Detailed concern for the rehabilitation problems of children and adults in the area of auditory training, speech reading and speech conservation. Clinical practice.
660. **CLINICAL PROBLEMS IN HEARING (2).** Pr., CD 465, 560, 561, and 562, or COI. May be repeated for credit.
661. **PEDIATRIC AUDIOLOGY (4).** Pr., CD 560, 561, 562, or COI. Etiologic factors, screening, audiologic assessment, differential diagnosis, and clinical management of infants and children with hearing disorders.
662. **ADVANCED CLINICAL AUDIOLOGY I (4).** Pr., CD 560, 561, 562, or COI. Audiometric calibration, instrumentation, and physical requirements for audiometry. Introduction to advanced audiometric techniques with an emphasis on evaluation of the peripheral auditory system.

663. **ADVANCED CLINICAL AUDIOLOGY II (4).** Pr., CD 560, 561, 562, or COI. Continuation of SC 662. Advanced techniques in differential diagnosis of auditory function emphasizing assessment of pseudohypoacusis, the central auditory system and the use of physiologic methods.
664. **AURAL REHABILITATION (4).** Pr., CD 560, 561, 562, or COI. Clinical and therapeutic management of persons with hearing disorders, including selection and use of individual and group amplifying systems and electro-acoustic measurement of hearing aid performance.
665. **INDUSTRIAL AUDIOLOGY (4).** Pr., CD 560 or COI. Measurement and control of environmental noise, industrial audiometry, medico-legal aspects, and conservation of hearing.
666. **PHYSIOLOGICAL ACOUSTICS (4).** Pr., CD 560, 561, 562, or COI. Review of the layout of the auditory pathways, instrumentation, psychoacoustics and electrophysiology of the auditory system, as well as literature related to normal audition.
667. **SEMINAR IN AUDIOLOGY (CREDIT TO BE ARRANGED.)** Pr., CD 560, 561, 562, or COI. Advanced treatment of contemporary topics and trends, as well as current research aspects of audiology. May be repeated for credit with change in topics.
668. **FIELD EXPERIENCE IN AUDIOLOGY (5-10).** S-U grading only. Full-time assignment in a speech and hearing facility, the choice being made from the following settings: university speech and hearing clinic, hospital, public school, and various community agencies serving speech- and hearing-impaired children and adults. May be repeated for a maximum of 10 hours credit. No more than 5 hours may be used for minimum requirements toward a master's degree.
669. **ADVANCED CLINICAL AUDIOLOGY III (4).** Rationale and procedures for evaluation of central auditory nervous system, including interpretation of test results.
690. **MANAGEMENT OF HEARING-IMPAIRED CHILDREN (4).** Familiarizes audiologists with the parameters involved in the management of hearing-impaired school aged children.

Computer Science and Engineering (CSE)

Professors Vick, Head, Brown, and deMaine
Associate Professors Day, Phillips, and Roggio
Assistant Professors Kim and Krishnamurthy

General Curriculum (GC) students (those with undeclared majors) may enroll only with departmental consent.

200. **FUNDAMENTALS OF STRUCTURED PROGRAMMING (4).** LEC. 3, LAB. 3. Coreq. MH 163. Introduction to time-shared computer systems and structured programming concepts; top-down development of programs; control structures and decision-making; program documentation.
204. **COMPUTER PROGRAMMING (3).** Pr., MH 151 or 161. Digital computer programming with emphasis on mathematical problems, using the FORTRAN programming language. (Not open to students with credit in IE 300 or CSE 200.)
220. **STRUCTURED PROGRAMMING II (4).** LEC. 3, LAB. 3. Pr., CSE 200. Fundamentals of program efficiency; representation of data types; debugging techniques; data conversion and manipulation; execution-time error detection and recovery.
230. **FILE MANAGEMENT (4).** LEC. 3, LAB. 3. Pr., CSE 220. Concepts of file organization and manipulation; access methods for sequential and random access files; data verification; program testing; dataset organization; program interaction with the operating system.
300. **STRUCTURED PROGRAMMING FOR ENGINEERS AND SCIENTISTS (3).** Fundamentals of structured programming principles, including top-down program design, program documentation, and advanced problem solving for engineering and scientific applications using a structured programming language. (Not open to students with credit in CSE 200.)
301. **COBOL PROGRAMMING FOR INFORMATION SYSTEMS (3).** Pr., One high-level language programming course. An introduction to business and information systems software design with the COBOL programming language.
305. **INTRODUCTION TO SOFTWARE ENGINEERING (3).** LEC. 2, LAB. 3. Pr., IE 300 or CSE 200 or CSE 204. Tools and methodology for the design of complex management information/decision systems composed of integrated programs, data files, and user interfaces.
330. **INTERACTIVE COMPUTER GRAPHICS (3).** LEC. 2, LAB. 3. Pr., CSE 200 or CSE 300. Introduction to computer graphics systems and graphics packages; use of a graphics package for typical engineering applications.
335. **COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE PROGRAMMING (4).** LEC. 3, LAB. 3. Pr., EE 330. Stored program computers, hardware components, software components; data representation and number systems; instruction sets; addressing modes and assembly language programming; sub-routines and macros; assemblers; loaders, linkers and operating systems; memory, memory cycle, and memory hierarchy; arithmetic/logic unit; control unit, program counter, and instruction cycle; input/output, input/output programming, and interrupts. (Credit is not allowed for both EE 335 and CSE 335.)
340. **DATA STRUCTURES (3).** Pr., CSE 230. Theory of data structures and their computer representations: lists; stacks; queues; deques; priority queues; trees; graphs.

350. **ASSEMBLY LANGUAGE PROGRAMMING (3).** Pr., CSE 220. An introduction to machine-oriented programming systems for digital computers. Emphasis will be placed on programming with the IBM 360/370 assembly language, macro programming and subroutine usage.
360. **FUNDAMENTAL ALGORITHM DESIGN AND ANALYSIS (3).** Pr. CSE 340. Algorithm development using pseudo-languages; elementary program structures; classification of algorithms, e.g. recursive, divide-and-conquer, greedy, etc.; algebraic simplification and transformation; evaluation of polynomials; iteration; sorting; solving linear equations; basic search methods and backtracking.
490. **SPECIAL TOPICS. (CREDIT TO BE ARRANGED.)** Pr., COI. May be taken more than one quarter.
498. **HONORS THESIS (3-6).** Pr., COI and department head approval. Individual student endeavor consisting of directed research and writing of honors thesis. (CSE Honors Program students only. May be repeated once for a maximum of 6 total credit hours.)
499. **SPECIAL PROJECTS. (CREDIT TO BE ARRANGED.)** Pr., COI. May be taken more than one quarter.

ADVANCED UNDERGRADUATE AND GRADUATE COURSES

500. **SYSTEM PROGRAMMING PRINCIPLES I (3).** Pr., CSE 350, CSE 360. A review of machine structure, machine language and assembly languages followed by an introduction to the design of assemblers, macro processors, and loaders. An introduction to formal systems, compilers and compiling techniques, and an overview of operating system principles.
501. **SYSTEM PROGRAMMING PRINCIPLES II AND OPERATING SYSTEMS (4).** LEC. 3, LAB. 3. Pr., CSE 500. Design and implementation of an assembler, a macro processor and a binder/loader as a comprehensive project; review of design algorithms for assemblers, macro processors and loaders; introduction to the concepts and techniques for the efficient management of computer system resources.
505. **OPERATING SYSTEMS DESIGN PRINCIPLES (3).** LEC. 3, LAB. 2. Pr., CSE 501, EE 430. The structure and functions of operating systems; scheduling algorithms; auxiliary storage management process communication techniques; performance measurement and evaluation; networking and security; case studies: UNIX, VAX, and CP/M. Implementation of a hypothetical personal computer mini-operating system.
511. **DATABASE SYSTEMS I (3).** Pr., CSE 500. An introduction to database systems: basic concepts, storage structures, data models and data sublanguages; relational, hierarchical, network and JOBLIST models.
512. **DATABASE SYSTEMS II (3).** LEC. 3, LAB. 2. Pr., CSE 511. Review of database systems with special emphasis on the comparison of relational, hierarchical, network, and JOBLIST approaches; design and implementation of a database management system as a coordinated comprehensive project; methods of indexing and abstracting text.
520. **FORMAL THEORY OF COMPUTER LANGUAGES I (3).** Pr., MH 371, CSE 500. A detailed study of mathematical models of regular and context-free languages; non-deterministic and deterministic models; closure properties; decision algorithms; simplification of grammars, Chomsky Normal Form; Greibach Normal Form.
521. **COMPILER CONSTRUCTION (4).** LEC. 3, LAB. 3. Pr., CSE 520. Review of language structures, systems programs, and storage allocation; translation of statements and expressions; compiler organization, symbol tables, scanning, object code generation, diagnostics, code optimization.
522. **SOFTWARE ENGINEERING I (4).** LEC. 3, LAB. 3. Pr., IE 311, CSE 521. Design of reliable software; error causes and consequences; requirements, specifications, and objectives related to reliable design; software testing, test case design, test tools, path testing, and transaction flows; data validation and syntax charts; programming languages and reliability, proving program correctness, and reliability models.
523. **ADVANCED PROGRAMMING (3).** Pr., COI. Advanced topics in current procedural or command languages for systems programming, software engineering, or data management applications.
524. **DISCRETE STRUCTURES (4).** Pr., MH 371. Mathematical logic, predicate calculus, set theory, graph theory, Petri Nets, algebraic structures, and theory of computation, developing a mathematical background for work in compilers, artificial intelligence, software engineering and switching theory.
530. **COMPUTER ARCHITECTURE AND DESIGN I (4).** Pr., EE 430. Structural organization and hardware design of digital computers; register transfers; micro-operations, control units and timing; instruction set design; microprogramming; automated hardware design aids. (Credit is not allowed for both EE 530 and CSE 530.)
531. **DISTRIBUTED DATA PROCESSING I (3).** Pr., CSE 530. Overview of distributed data processing concepts; hardware architectures and configurations; system and application software design; problem design; interprocess communication; system performance evaluation; fault tolerance. Decentralized control, distributed operating systems, and distributed databases. (Credit is not allowed for both EE 531 and CSE 531.)
532. **COMPUTER PERFORMANCE EVALUATION (4).** Pr., MH 371, IE 311, CSE 500. Introduction to the tools and techniques used in evaluating the performance of computing systems; objectives of performance evaluation; methods measurement, including simulation and analytic techniques; case studies.
533. **PARALLEL AND CONCURRENT PROCESSING (3).** Pr., CSE 500, CSE 530. Hardware and software elements of multiprocessors, multicomputers, pipeline and array machines, and data flow architecture; design principles related to machine structures, control software and hardware, data storage and access, programming languages, and application algorithms. (Credit is not allowed for both EE 533 and CSE 533.)
540. **FUNDAMENTALS OF COMPUTER GRAPHICS SYSTEMS (4).** LEC. 3, LAB. 3. Pr., CSE 220, EE 335 and junior standing. Hardware and software components of computer graphics systems; display files, two-dimensional and three-dimensional transformations, clipping and windowing, perspective, hidden-line elimination and shading, interactive graphics; survey of applications.

550. **AUTOMATIC SPEECH PROCESSING (4).** Pr., senior standing and EE 362 or COI. Introduction to Fourier, z, and Fast Fourier transforms; discrete time signals and systems; digital models of the speech signal; speech coding schemes; spectrograms, cepstrum, and linear prediction analysis of speech; time domain techniques; introduction to human-machine communication by voice.
560. **ARTIFICIAL INTELLIGENCE AND SYMBOLIC PROGRAMMING I (4).** LEC. 3, LAB. 3. Pr., CSE 360, MH 371. Introduction to machine intelligence; methods of representation and problem solving; heuristics; search methods; problem reduction techniques; game trees; predicate calculus; symbolic pattern matching.
561. **ARTIFICIAL INTELLIGENCE AND SYMBOLIC PROGRAMMING II (3).** LEC. 3, LAB. 2. Pr., CSE 560. Natural language understanding; speech and image understanding; knowledge representation; application to program verification; introduction to expert systems.
590. **SPECIAL TOPICS. (CREDIT TO BE ARRANGED.)** Pr., COI. May be taken more than one quarter.

GRADUATE

601. **ADVANCED SYSTEMS PROGRAMMING (3).** Pr., CSE 501 or COI. Interrupt handler design principles, data management macros, access methods, data channel programming, operating system generation, operating system modification, patching, operating system macro facilities programming, file structures and management.
605. **MODERN OPERATING SYSTEMS (3).** Pr., CSE 505 or COI. Modern operating systems design principles, multi-processor operating systems, computer systems performance modeling and evaluation, computer system security, survey of current literature on operating systems and architectural support of operating systems.
612. **INFORMATION STORAGE AND RETRIEVAL (3).** Pr., CSE 511 or COI. Problems germane to automating libraries; systems analyses and evaluation; dynamic information processing; automatic query and document classification; comparison of Salton, Hillman and DEACON methods.
613. **AUTOMATIC DEDUCTIVE SYSTEMS (3).** Pr., CSE 560 or COI. Definition and classification of automatic deductive systems; learning systems; examples of numeric and alphanumeric deductive systems.
620. **FORMAL THEORY OF COMPUTER LANGUAGES II (3).** Pr., CSE 520 or COI. Turing machines, recursively enumerable languages, and phrase structure grammars; context-sensitive languages and linear bounded automata; deterministic context-free languages and LR grammars; closure properties of families of languages; auxiliary pushdown automata, stack automata, indexed languages.
621. **ADVANCED COMPILER CONSTRUCTION (3).** Pr., CSE 521 or COI. Methods for designing interactive, transportable, and retargetable compilers and interpreters. Converter portable, verifiers, the DUMP method, self-compiling compilers, language emulators and abstract machine modelling.
622. **SOFTWARE ENGINEERING II (3).** Pr., CSE 522 and CSE 524 or COI. Programming systems and languages, structured software design steps and automated design tools; requirements specification languages; program-to-program interfaces; verification and validation; simulated support tools.
623. **COMPUTATIONAL COMPLEXITY (3).** Pr., CSE 520 or COI. Turing machines and partial recursive functions; undecidability; hierarchy theorems and relations among complexity measures; nondeterministic hierarchies; NP-complete problems; provably intractable problems.
624. **PETRI NETS AND CONCURRENT SYSTEM MODELING (3).** Pr., CSE 524 or COI. Theory and application of Petri Nets; modeling and analysis of computer hardware and software; concurrency and conflict; complexity and decidability; Petri Net languages; related models of parallel computation.
626. **ADVANCED COMPUTER ARCHITECTURE (3).** Pr., CSE 530 or COI. Computer architecture and design principles; computer structures; partitioning; pipelining; vector processing; multi-processing; and case studies. Credit is not allowed for both EE 626 and CSE 626.
627. **SPECIAL TOPICS IN COMPUTER ARCHITECTURE (3).** Pr., CSE 626 or COI. Current topics in developing computer architecture, with emphasis varying according to research interest. Credit is not allowed for both EE 627 and CSE 627.
631. **DISTRIBUTED DATA PROCESSING II (3).** Pr., CSE 531 or COI. Advanced topics in distributed data processing, including decentralized control and distributed operating systems, fault tolerance techniques for distributed systems, dynamic reconfiguration of resources and applications of distributed networks. (Credit is not allowed for both EE 631 and CSE 631.)
632. **REAL TIME COMPUTING SYSTEMS (3).** Pr., CSE 530 or COI. Requirements and application of real time computing: architecture, control, resource allocation, data storage and access, design, implementation, and testing. (Credit is not allowed for both EE 632 and CSE 632.)
633. **SPECIAL PURPOSE COMPUTING SYSTEMS (3).** Pr., CSE 530 or COI. Special purpose computing devices, including residue number processors, instruction set architecture, optical data processing, logic enhanced memory devices, and other special purpose computational structures. (Credit is not allowed for both EE 633 and CSE 633.)
636. **COMPUTER NETWORKS AND DATA COMMUNICATIONS (3).** Pr., CSE 530 or COI. Introduction to distributed systems, network architectures, protocols, digital communication links, data management, and related software design. (Credit is not allowed for both CSE 636 and EE 636.)
640. **THEORY OF CONCURRENT SYSTEMS (3).** Pr., CSE 626 or COI. The theory of concurrent computer architectures and research in multiple processor computing environments. (Credit is not allowed for both EE 640 and CSE 640.)
642. **FAULT TOLERANT COMPUTING (3).** Pr., CSE 530 or COI. Architecture and design of fault tolerant computer systems using protective redundancy, estimation of the reliability and availability of fault tolerant systems, error recovery, and fault diagnosis. (Credit is not allowed for both EE 642 and CSE 642.)

- 650. **COMPUTER SPEECH SYSTEMS (3).** Pr., CSE 550 and CSE 560 or COI. High quality speech coding; text-to-speech synthesis systems; isolated word recognition; continuous speech understanding; speaker verification/identification techniques.
- 660. **KNOWLEDGE ENGINEERING AND EXPERT SYSTEMS (3).** Pr., CSE 560 or COI. Basic concepts for the construction of expert systems and their related architecture; tools and languages for knowledge engineering analysis and design; case studies of expert systems.
- 680. **DIRECTED READING IN COMPUTER SCIENCE AND ENGINEERING. (CREDIT TO BE ARRANGED.)**
- 690. **SPECIAL TOPICS. (CREDIT TO BE ARRANGED.)** Pr., COI. May be taken more than one quarter.
- 695. **CSE SEMINAR, (CREDIT TO BE ARRANGED.)** Pr., COI. May be taken more than one quarter.
- 698. **SPECIAL PROJECTS. (CREDIT TO BE ARRANGED.)** Pr., COI. May be taken more than one quarter.
- 699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
- 799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Consumer Affairs (CA)

Professors Galbraith and Trentham

Associate Professors Warfield, Head, Barry, Douty, Hardin, and Slaten

Assistant Professors Allison, Beamish, Cavender, Clem, Duffield, and Potter

Instructors McKee, Summerford, and Weaver

- 105. **FUNDAMENTALS OF CLOTHING (5).** LEC. 2, LAB. 8. Pr., CA 115 concurrently or COI. Basic theories and principles of garment selection and structure, including their application in construction of apparel for personal use.
- 113. **HOUSING FOR MAN (3).** Housing, equipment, and furnishings in terms of the total environment with reference to physical, biological, economic, cultural, and social conditions which affect the family.
- 115. **CLOTHING AND MAN (3).** Cultural, aesthetic, functional, and technological factors as they interact to determine the meaning and use of clothing and textiles for the individual and society.
- 116. **ART FOR LIVING (3).** A working knowledge of basic concepts in the organization and evaluation of design with emphasis placed upon the contribution of design and color as enrichment of individual and family environment.
- 116L. **ART FOR LIVING LABORATORY (2).** LAB. 4. Pr., CA 116 or concurrently. Provides the opportunity for individuals to explore color and design concepts through the manipulation of materials, tools, and processes and to obtain design evaluation experience.
- 204. **COMMERCIAL APPAREL PRODUCTION (3).** LEC. 1, LAB. 4. Pr., CA 105 or COI. The nature and capabilities of industrial apparel production equipment; the principles of operation with application.
- 205. **CLOTHING CONSUMPTION AND SELECTION (3).** Pr., CA 115, CA 116 or equivalent. A survey of the clothing market, consumption problems of consumers, and selection of clothing at all stages of the life cycle.
- 206. **GARMENT STRUCTURES — THEORY AND APPLICATION (3).** LEC. 1, LAB. 4. Pr., CA 105 or COI. The materials, strategies, processes, and sequences in shaping fabric to the human form; the interaction of these factors in determining function and quality.
- 209. **TAILORING (3).** LAB. 9. Pr., CA 105 or equivalent. Principles of fabric selection and tailoring applied in planning and construction of a suit or coat.
- 216. **ART FOR LIVING II (3-5).** (3) LEC. 2, LAB. 2. (5) LEC. 2, LAB. 6. Pr., CA 116, 116L or equivalent. A continuation of the individual's artistic environment with emphasis on the application of principles of design and color to specific problems of everyday life.
- 224. **PRESENTATION FUNDAMENTALS FOR INTERIOR FURNISHINGS AND EQUIPMENT (2).** LAB. 6. Pr., CA 116L; major in IFE program. Introduction to basic skills, materials, and techniques employed in the visual and verbal presentation of interior furnishings, designs.
- 225. **TEXTILES (5).** Pr., CH 203. Polymers, fibers, yarns, fabrics, and finishes in their relationship to apparel and household textiles.
- 226. **FASHION SKETCHING (3).** LAB. 6. Pr., CA 116, 116L or equivalent. Provides for the fashion merchandising of clothing design major simple methods of communicating apparel designs through quick sketches to portray fashion in silhouettes, texture, and color.
- 233. **HOME EQUIPMENT I (5).** LEC. 3, LAB. 4. Home equipment, major and small appliances: emphasis on design, materials and construction, energy requirements, safety standards, operation, and maintenance.
- 303. **THE HOUSE (5).** LEC. 2, LAB. 6. Analysis, organization, and development of functional residential living spaces, with emphasis on the familial influence.
- 313. **HOME FURNISHINGS (5).** Pr., CA 116 or equivalent. Construction techniques, materials, and processes of manufacture. Historical overview and study of period styles.
- 316. **FASHION ANALYSIS (5).** Pr., CA 205. The dynamic nature of fashion and the interacting forces which shape fashion trends in apparel.
- 323. **MAN THE CONSUMER (3).** Pr., junior standing or COI. All quarters. Management of family resources and consideration of alternatives available to families as consumers. Consumer problems, use of information sources, and analysis of laws protecting consumers.

325. **FASHION MERCHANDISING (5).** Pr., MT 331, 333. Application of principles and practices of merchandising to the retailing of consumer goods and services.
333. **LIGHTING DESIGN (5).** LEC. 3, LAB. 4. Application of functional and aesthetic concepts of lighting design to residential living spaces.
334. **INTRODUCTION TO FIELD EXPERIENCE (2).** Pr., junior standing or COI. Prepares students for maximum utilization of supervised professional field experiences.
335. **FIELD EXPERIENCE IN RETAILING (13).** Pr., CA 325, 334. Three months practical experience, with pay, in large department store. Students are given formal instruction and supervision. Scheduled only by pre-arrangement.
336. **FIELD EXPERIENCE IN CONSUMER AFFAIRS (5-15).** Pr., departmental approval of application. Supervised professional experience. Participating firm or agency selected with faculty approval.
342. **ANALYTICAL INSTRUMENTATION IN TEXTILES (3).** LEC. 2, LAB. 2. Pr., all Basic Textile courses, TE 241. Use of specialized analytical instrumentation to assist in the production of textile products; as means to solve problems of color mixing, waste water characterization, dust measurement, and the identification of materials. Systems control by instrumentation is also included.
343. **INTERIOR HOME PROBLEMS (5).** The application of design principles to harmonious combinations of interior furnishings, materials, and finishes.
345. **CREATIVE CRAFTS (1-2-3).** LAB. 2-4-6. Creative design and execution of a variety of current crafts. Outside research required.
350. **COMPUTER APPLICATIONS IN HOME ECONOMICS (3).** LEC. 2, LAB. 6. Pr., 5 hrs. of MH, 10 hrs. in student's major area. History of computing devices; theory and practice of computer operation. Students learn BASIC. A major programming project related to the student's major area is required.
355. **CONSUMER TEXTILES (3).** LEC. 3. Textile fabrics, finishes, and trade practices with special emphasis on consumer problems. Credit will not be allowed for both CA 225 and CA 355.
385. **CREATIVE WEAVING (3).** Weaving design and experience in selecting yarns, setting up a loom, and weaving one's own fabric.
395. **CLOTHING DESIGN (5).** LEC. 2, LAB. 6. Pr., CA 206, 226, or COI. Principles of design, structure, and production as they guide designing of apparel within the fashion and cultural context. Designs developed by sketching.
398. **PROFESSIONAL PLANNING AND DEVELOPMENT (1).** Pr., junior standing or COI. Professional development course designed to assist home economics students in the transition from student to professional.
399. **EXPERIENTIAL LEARNING (2-6).** Pr., sophomore standing and COI.
431. **MAN-ENVIRONMENT RELATIONS (2).** Pr., Home Economics core courses or COI. The unifying principles and ideals, which are concerned with man's immediate physical environment (housing, clothing, food) and with his nature as a social being. Analysis and synthesis of principles explored in Home Economics core courses CA 113, 115, 116, NF 112, FCD 157, and CA 323.
443. **FAMILY RESOURCE MANAGEMENT RESIDENCE (5).** Pr., CA 113, 323, NF 104, 112, FCD 157, junior standing or COI. Experiences in managing a home utilizing various levels of resources. Emphasis is placed on the management process, group relationships, and allocation of scarce resources.
473. **CONTEMPORARY HOME FURNISHINGS (3).** LEC. 2, LAB. 2. Pr., CA 313, 343. Analysis of current developments in the interior home furnishings market; procedures and practices in furnishings merchandising; survey of design concepts of the contemporary interior and its furnishings.
478. **VISUAL MERCHANDISING (3).** LEC. 2, LAB. 2. Pr., junior standing, CA 116 or equivalent, MT 331 or COI. Exploration of history, equipment, application, and theory of display techniques. Emphasis is on displays in windows and interior store settings.
490. **INDEPENDENT OR FIELD STUDY (1-6).** An individual problems course involving directed readings and/or laboratory or field experiences under the direction of a faculty member on some problem of mutual interest. Field experiences may include work with families, business, or industry.

ADVANCED UNDERGRADUATE AND GRADUATE

505. **COSTUME DRAPING (5).** LEC. 2, LAB. 9. Pr., 8 quarter hours of clothing construction. Creative experience in development and execution of apparel designs through draping varied fabrics on individualized body structures. Exploration and application of theories, philosophies, and practices of contemporary designers.
511. **CLOTHING FOR THE HANDICAPPED AND AGED (2).** Pr., junior standing. The physical, psychological and social facets of selecting, adapting, and designing clothing for the aged and handicapped.
- 511L. **CLOTHING FOR THE HANDICAPPED AND AGED LABORATORY (2).** LAB (4). Pr., CA 105 or equivalent, junior standing; coreq. CA 511. Concepts learned in CA 511 are applied to laboratory problems.
513. **HOUSING FOR SPECIAL NEEDS (4).** LEC. 4. Pr., CA 113, PG 211 or equivalent, or COI. Examination of physical, social, economic, and psychological needs of the elderly and handicapped in relation to their home and community environments. Emphasis on evaluation of housing alternatives for both groups.
514. **SOCIAL PROBLEMS OF HOUSING (5).** Pr., CA 113 or equivalent, or COI. Current housing policies explored as both causes of and solutions to certain social problems. Zoning and exclusionary practices, public housing, cash subsidies for housing examined.
515. **HISTORY OF TEXTILES (5).** Pr., AT 171, 172, 173 or HY 101, 102, 103. The development of the textile industry and of fabric design from the earliest times to the present day.

516. **APPAREL QUALITY ANALYSIS (5).** Pr., CA 105 and 325 or equivalent and junior standing. Analysis of quality variations of soft goods and study of factors affecting quality of materials, manufacturing processes, markets, and resources.
521. **WORLD APPAREL, TRADE, PRODUCTION, AND DISTRIBUTION (4).** Pr., MT 331 or COI. The large textile and apparel manufacturers who have units outside the U.S. foreign apparel companies who have plants in the U.S., international trade agreements and other factors which influence international trade in textiles and apparel.
523. **GOVERNMENT AND THE RETAILER (5).** Pr., junior standing, COI. Informative, statistical, and regulatory aspects of governmental departments and agencies affecting textiles and clothing retail operations.
524. **PLANNED CHANGE IN THE FASHION INDUSTRY (5).** Pr., CA 325 or COI. The process involved in initiating and implementing change in the fashion industry.
525. **HISTORY OF COSTUME (5).** Pr., AT 171, 172, 173 or HY 101, 102, 103. Evolution of Western costume from prehistoric time to present day.
528. **CONSUMER ECONOMICS (5).** Pr., EC 202 and CA 323 or COI. Consumption as an economic activity; theory of consumer choice. The consumer's role in the American economy; impact of various market structures on the consumer; consumer protection; economic issues affecting the consumer.
530. **CONSUMER/FAMILY ECONOMIC ISSUES AND PUBLIC POLICY (3).** Pr., EC 202 and CA 323 or COI. Investigation of the impact of consumer and family oriented laws and policies on individuals/families. Exploration of individual/family involvement with public policy and legal resources as a means for realizing satisfying lifestyles.
533. **HOME EQUIPMENT II (5).** LEC. 4, LAB. 2. Pr., PS 200, CA 233. Design, operation, and physical layout of equipment comprising the residential utility core; air treatment, water supply, and distribution; kitchen, laundry, and bath design; energy requirements.
535. **TEXTILE TESTING (5).** LEC. 2, LAB. 6. Pr., CA 225 or equivalent. Standard testing procedures and equipment used in determining the physical and chemical characteristics of fibers, yarns, and fabrics, and of the statistical methods employed in data evaluation.
538. **STUDY/TRAVEL IN CONSUMER AFFAIRS (2-8).** Course may be repeated for a maximum of 12 undergraduate credits or 8 graduate credits. Pr., junior standing, COI. Concentrated study in clothing, textiles, housing, interior furnishings or merchandising in U.S. or foreign locations which offer unique resources for investigation in one of these content areas. Lectures presented at pre-arranged points. Papers required on selected phases of the course.
541. **FAMILY FINANCIAL MANAGEMENT (5).** Pr., CA 323 or COI. Family financial planning, including short-term money management, long-term planning, allocation of family resources, and use of credit.
553. **THE CONSUMER AND THE MARKET (3).** Pr., MT 331, CA 323. Examination of some factors that determine consumer satisfaction with production performance and value.
555. **FLAT PATTERN DESIGNING (5).** LEC. 2, LAB. 8. Pr., 8 quarter hrs. clothing construction. Pattern blocking in personal and commercial pattern production. Foundation sloper developed for pattern drafting. Consideration given to figure variations and their effect on styling and production.
556. **COMPARATIVE METHODS OF APPAREL PRODUCTION (5).** LEC. 2, LAB. 6. Pr., 8 quarter hours of clothing construction. End-use qualities of apparel in relation to options in methods of production and organizational procedures. Implications for consumer decisions and industrial quality control and pricing.
560. **TEXTILE FINISHES (4).** Pr., CA 225 or equivalent, junior standing. Chemistry and mechanics involved in finishing textile materials. Properties of finished fabrics related to end use.
- 560L. **TEXTILE FINISHES LABORATORY (1).** LAB. 3. Coreq. CA 560. Techniques of textile finishing. Analysis and evaluation of finishes.
570. **ALLOCATION OF FAMILY RESOURCES (3).** Pr., FCD 270, CA 323, 431 or COI. The process of decision-making in families for achieving goals through the effective use of human and material resources. Analysis of case studies and examination of consumer and management problems at all socioeconomic levels.
575. **CREATIVE TEXTILE DESIGN (5).** LAB. 9, OUTSIDE WORK TO BE ARR. Pr., CA 116, 116L, or AT 121. Introductory techniques used in the creative decoration of fabric, with experience in the execution of these techniques for both fashion and interior textiles.
576. **ADVANCED PRINTING AND DYEING. A. DISCHARGE AND RESIST PRINTING; B. BLOCK PRINTING; C. SCREEN PRINTING. (3-3-3).** LAB. 6. Pr., CA 575, junior standing. May be repeated for a maximum of 9 credits. Techniques of each type of printing and dyeing studied. Development of designs for hand printing and commercial application. Outside research required.
580. **PROBLEMS IN DESIGN. A. CLOTHING; B. TEXTILE DESIGN; C. CLOTHING AND TEXTILE DESIGN (3-5).** LEC. 1, LAB. 9-12. Pr., for A, CA 505 and 555; for B and C, foundation courses in the field, COI. Creative work integrating methods, materials, and processes in solution of specified design problems. May be repeated and combined for a maximum of 10 hours.
583. **SOILING AND DETERGENCY OF TEXTILES (5).** LEC. 4, LAB. 2. Pr., PS 200 or COI, CA 225 or equivalent. Physical and chemical principles involved in textile soil deposition and removal. Effect of soil removal methods on functional properties of textile materials.
586. **RUG WEAVING (5).** LAB. 15. Pr., CA 385. Various rug weaving techniques, history, development, use in hand weaving, and application to commercial production.
587. **ADVANCED PATTERN WEAVING (5).** LAB. 15. Pr., CA 385. Advanced pattern weaves used in hand weaving and applicable to commercial production.

588. **EXPERIMENTAL WEAVING (5).** Pr., CA 586, 587. Experimental work with yarns, fibers, and related materials, while initiating and solving individual creative problems using advanced weaving techniques. Allows for student interaction and further preparation of portfolio work.

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601. **SEMINAR. A. CLOTHING; B. TEXTILES; C. DESIGN; D. HOUSING; E. GENERAL (1-5).** May be taken more than one quarter in residence for a maximum of 10 credits.
605. **METHODS OF RESEARCH IN HOME ECONOMICS (3).** Pr., BY 501 or MN 274 or 570. Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Home Economics.
609. **SPECIAL PROBLEMS. A. CLOTHING; B. TEXTILES; C. TEXTILE DESIGN; D. HOUSING; E. FAMILY RESOURCE MANAGEMENT; F. CONSUMER AND FAMILY ECONOMICS; AND G. HISTORIC COSTUMES AND/OR TEXTILES (2-5).** Pr., COI. May be repeated and combined for a maximum of 15 hours.
610. **ADVANCED DESIGN STUDIO. A. CLOTHING; B. TEXTILES DESIGN; C. CLOTHING AND TEXTILE DESIGN; D. HISTORIC COSTUME AND/OR TEXTILES (3-5). LEC. 1, LAB. 5-9.** Pr., foundation courses in the field, COI. Advanced program for synthesizing study and creative work in student's selected field. May be repeated and combined for a maximum of 15 hours.
630. **RECENT RESEARCH IN CONSUMER AND FAMILY ECONOMICS (3).** Pr., EC 200, 202, SY 220, CA 528, and COI. Synthesis of recent research dealing with development and trends in consumer and family economics.
631. **READINGS IN CONSUMER AND FAMILY ECONOMICS (1-4).** Pr., CA 323, EC 202 or COI. Independent readings in consumer and family economics.
632. **RESEARCH TECHNIQUES IN HOUSING (5). LEC. 4, LAB. 1.** Pr., statistics and COI. Housing research with particular emphasis on survey methods and data analysis.
633. **FAMILY HOUSING (5). LEC. 5.** Pr., EC 200, SY 201, CA 113 or equivalent. The effects of housing on socio-psychological aspects of the individual and family: economic, legal, and social implications, present trends.
634. **THE FAMILY IN THE AMERICAN ECONOMY (3).** Pr., EC 200, 202; CA 528 or COI. Analysis of the family as an economic unit; standards and levels of living; hazards in the family economy. Examination of the economic effect of government policies and programs on the family.
636. **FAMILY RESOURCE DEVELOPMENT AND ALLOCATION (3).** Pr., EC 200, 202, and CA 634 or COI. Economic analysis of conditions, programs, and policies related to development and use of human and non-human resources, with special reference to impact on families and households.
650. **SOMATOMETRY AND GARMENT STRUCTURES (4). LEC. 2, LAB. 5.** Pr., undergraduate courses in clothing and textiles, COI. Theoretical base of problems involved in building garments. Body contour analysis used to plan pattern adjustments. Management of materials, equipment, and processes in garment styling and construction.
652. **CLOTHING AND TEXTILES LITERATURE (5).** A critical examination of the current literature in the fields of clothing and textiles.
653. **ECONOMICS OF CLOTHING AND TEXTILES (5).** Pr., EC 200, CA 205 or equivalent and COI. Examination of literature on economics of clothing and textiles. Modern trends in manufacture, distribution, and consumption, with government regulations, labor laws, and international implications.
658. **CHEMICAL AND PHYSICAL ANALYSIS OF TEXTILES (5). LEC. 3, LAB. 4.** Pr., CH 207. The theory and application of chemical and physical analytical methods to textiles.
659. **FIBER FORMING POLYMERS (5).** Pr., CH 203 or CH 207. The dependence of fiber properties on the chemical formula, the molecular arrangement, and the morphology of polymers. The influence of chemical and physical treatments on polymers and ultimate fiber properties.
662. **PRACTICUM IN CONSUMER AND FAMILY ECONOMICS (2-8).** May be repeated for a maximum of 8 hours of credit. Pr., departmental approval.
667. **CLOTHING AND BEHAVIOR (5).** Pr., basic courses in Sociology, Psychology, and COI. Clothing as a factor in the physical, social, and psychological environment of man, his response to and use of clothing as an aspect of individual behavior and culture.
669. **PERSONALITY PROJECTION THROUGH CLOTHING (3).** Pr., CA 667; FCD 610 or PG 433 or equivalent. Psychological processes and theories of personality in relation to clothing-oriented behavior, as supported by research. Emphasis is placed on the interrelationships among the self, the body, and clothing at stages of the life cycle.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** Required of all students under the Thesis Option in any field.

Counselor Education (CED)

Professors Meadows, Head, Donnan, Moracco, and Valine
Associate Professors Buckhalt, Byrd, Higgins, McEwen, and Pipes
Assistant Professors Bearden, Ragan, and Westfeld

Prerequisites and corequisites in the Department of Counselor Education are experience in appropriate fields and employment or professional objectives leading to

employment in public school counseling, psychoeducational diagnosis (school psychometry), rehabilitation counseling, mental health counseling, counselor education and college student personnel work. CED 621, CED 622, or equivalent, is a prerequisite or corequisite to advanced study.

- 101. **CAREER EXPLORATION AND PLANNING (1).** Helps undeclared freshmen in planning careers.
- 321. **LEADERSHIP IN STUDENT DEVELOPMENT (3).** Pr., sophomore standing and COI. For students interested in increasing their understanding and skills in group dynamics and leadership. Particular attention will be paid to application of course content and activities to current co-curricular programs in which students are involved.
- 322. **HUMAN RELATIONS TRAINING IN TEACHER EDUCATION (2).** Students are trained in facilitative communication skills which would lead to (1) a deeper understanding of students and the learning process; (2) a more positive working relationship with peers; (3) more efficient methods of classroom management and conflict resolution; and (4) more effective use of support personnel in the school system.
- 422. **HUMAN RELATIONS TRAINING FOR THE HEALTH PROFESSIONS (4).** Human relations skills for health care providers; study and practice of the communication process with individuals and in small groups. Limited to students in the health professions.

ADVANCED UNDERGRADUATE AND GRADUATE

- 521. **COUNSELING AND HUMAN SERVICES (4).** Counseling concepts and skills appropriate in the helping professions. Not open to graduate students in Counselor Education.
- 522. **INTRODUCTION TO COUNSELING THE EXCEPTIONAL INDIVIDUAL (4).** Pr., CED 322. Development of interpersonal relationship skills for persons interested in working with the disabled-physical, mental, social, or mental retardation. Emphasis upon unique aspects of these skills to the handicapped.
- 523. **MEDICAL AND ADJUSTMENT ASPECTS OF DISABILITY I (5).** Pr., COI and junior standing. Orientation to medical and adjustment aspects of the disabled individual. Understanding and using medical and paramedical personnel effectively in the rehabilitation process.
- 524. **COMMUNITY RESOURCES IN REHABILITATION (3).** The utilization of community resources in furthering the rehabilitation of the disabled individual; the vocational rehabilitation worker as a referral source; and the utilization of those in the community in a coordinated approach to total rehabilitation of the individual.

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- 610. **REHABILITATION PROGRAMS, PROFESSIONS AND SERVICES (2).** Pr., COI and graduate standing. History, parameters, career opportunities, and issues in vocational rehabilitation and roles of various professionals. (This course is also offered as RSE 610.)
- 621. **PRINCIPLES OF GUIDANCE AND STUDENT PERSONNEL WORK (5).** Enables students to develop a conceptual framework for viewing the inter-relationship of guidance and counseling in terms of (1) personal and social factors and (2) their place in a comprehensive program of student personnel work.
- 622. **INTRODUCTION TO REHABILITATION COUNSELING (4).** Pr., graduate standing. Counseling process in the rehabilitation setting including basic helping skills. Focusing on the professional, legal, and ethical responsibilities of the counselor.
- 624. **MEDICAL AND ADJUSTMENT ASPECTS OF DISABILITY II (5.)** Pr., CED 523. A continuation of CED 523. Focuses on rehabilitation with the chronically disabled.
- 625. **INTERNSHIP (5-15).** Supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled, on-campus discussion periods for positive evaluation and analysis of the intern experience.
- 626. **CASE MANAGEMENT IN REHABILITATION COUNSELING (5).** Pr., CED 622 or COI. A critical analysis of representative rehabilitation cases, and case records. Attention is focused on process, diagnosis, and provision of services.
- 627. **PROBLEMS IN GUIDANCE (5).** Pr., COI. Develops competency in the application of counseling theory and research findings, with special emphasis on educational problems.
- 628. **COUNSELING THEORY AND PRACTICE I (5).** LEC. 3, LAB. 4. Pr., or coreq., CED 621 or 622. Presents alternative theoretical strategies of counseling; prepares the student for further study of the theoretical and practical aspects of counseling; and provides field opportunities for practical application of theoretical concepts.
- 629. **COUNSELING THEORY AND PRACTICE II (5).** Pr., CED 628. A continuation of CED 628.
- 630. **GROUP DYNAMICS IN COUNSELING (5).** Pr., CED 621. Contemporary theories and analysis of concepts, models and pertinent research in group dynamics as it pertains to counseling.
- 631. **GROUP PROCEDURES IN COUNSELING (5).** Pr., CED 621, 628. The history, philosophy, and principles of group counseling and guidance. Includes pertinent research, and the dynamics of group interaction in counseling settings.
- 632. **ORGANIZATION AND ADMINISTRATION OF GUIDANCE PROGRAMS (5).** Pr., or coreq., CED 621. For administrative and guidance personnel. Topics discussed include principles of administrative practice, role of staff in regard to the guidance program, organizational patterns for guidance programs, possible ways of initiating a guidance program, and means of evaluation.
- 633. **ANALYSIS OF THE INDIVIDUAL (5).** Pr., or coreq., CED 621; Pr., PG 515. Emphasizes knowledge, understanding and skill necessary to obtain records and appraise information about the client as an individual and as a member of a group.

634. **COUNSELING IN THE ELEMENTARY SCHOOL (5).** Pr., CED 621. Counseling and related activities are considered in the scope of pupil personnel activities as a developmental process in the elementary school.
635. **PLACEMENT SERVICES IN REHABILITATION COUNSELING (3).** Pr., CED 622 or COI. Processes and procedures in placement of the handicapped including job modification, development, and analysis with special attention to the severely handicapped.
636. **VOCATIONAL APPRAISAL (5).** Pr., PG 515 or equivalent and COI. Appraisal of interest, aptitude, and personality tests used in the process of counseling with individuals confronted with vocational decisions. Laboratory practice in test administration, scoring, interpretation, and reporting.
637. **THEORIES OF VOCATIONAL DEVELOPMENT (5).** Pr., CED 621 or COI. Theories of vocational development with special emphasis on the integration and practical application of the theories in counseling.
638. **INFORMATION SERVICES IN GUIDANCE AND COUNSELING (5).** Pr., or coreq., CED 621 or 622. Educational and occupational information services and their relationship to counseling.
640. **PROFESSIONAL ISSUES IN SCHOOL PSYCHOLOGY (4).** Pr., admission to school psychology program, or COI. Professional roles and standards; ethical and legal concerns; current issues affecting professional practice.
641. **CONSULTATION (4).** Pr., CED 628 or COI. Theory, process, and content of consultation for counselors and school psychologists.
646. **DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
647. **SUPERVISORY PROCEDURES IN REHABILITATION COUNSELING (5).** Pr., EDL 620 and COI. Procedures and practices specific to the supervision of rehabilitation counselor and counselor-related services in rehabilitation agencies.
648. **PLANNING AND PROGRAM DEVELOPMENT IN REHABILITATION COUNSELING (5).** COI. Trends in program development, planning, and evaluation of research and theoretical writings in the area. A comprehensive study of research and demonstration projects in rehabilitation counseling.
650. **SEMINAR IN AREA OF SPECIALIZATION (1-5).** Pr., COI. May be repeated for credit not to exceed 10 hours. Provides for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.
653. **COUNSELING PROGRAMS IN HIGHER EDUCATION (5).** Pr., CED 621. Integration of counseling functions within the total student personnel program in higher education, legal and ethical aspects of counseling and student personnel work, and communication problems between groups within the institution and community.
654. **COLLEGE STUDENT DEVELOPMENT (5).** Pr., EDL 663. Developmental characteristics of college students, student cultural and environment, student movements, research concerning the diversity of college student population and implications for counseling and student personnel programs.
656. **RESEARCH AND EVALUATION IN COUNSELING (5).** Pr., FED 661, COI. Measurement, appraisal, and evaluation of a broad range of objectives in counseling and guidance. Emphasis on criteria, techniques and research procedures necessary to evaluate counselor programs.
662. **PHYSICAL DIMENSIONS OF COUNSELING (5).** Pr., CED 621 or 622. Implementation of physical fitness skills to raise the energy level of the helper; use of physical fitness and challenge response activities as a tool in the helping relationship. (This course is also offered as HPR 662.)
695. **PRACTICUM. (1-15).** Experiences relating theory and practice, usually simultaneously.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
798. **FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Curriculum and Teaching (CT)

Professors Weaver, Head, Alley, Cadenhead,
 Easterday, and Graves
 Associate Professors Allen, English, Henry, Kaplan,
 Johnson, Ley, Melvin, Noland, Rowsey, Silvern, Wilson,
 Wright, von Eschenbach, and Williamson
 Assistant Professors Jensen, Taylor, and Worden

Areas of Specialization: Art Education, Early Childhood Education, Elementary Education, English Language Arts Education, Foreign Language Education, Mathematics Education, Music Education, Reading Education, Science Education, Social Science Education, Journalism Education.

ART AND SPEECH COMMUNICATION/THEATER EDUCATION (CTN)

Each of the following courses may be taken as (A) Art Education or (B) Speech Communications/Theater Education:

- 102. **ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfers from other curricula and students pursuing the dual objectives program to understand teacher education and teaching as a profession.
- 104. **ORIENTATION TO LABORATORY EXPERIENCES FOR TRANSFERS (1).** Required of all students completing the Teacher Education Program. Orientation to the total Laboratory Experiences Program in the School of Education with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program.
- 414. **TEACHING IN ELEMENTARY AND SECONDARY SCHOOLS (3). LEC. 2, LAB. 2. Pr.,** FED 350 or equivalent. Admission to Teacher Education.
- 423. **PROGRAM IN ELEMENTARY AND SECONDARY SCHOOLS (3). LEC. 2, LAB. 2. Pr.,** FED 350 or equivalent. Admission to Teacher Education.
- 425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to Internship, appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.
- 446. **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
- 450. **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations normally in small groups.
- 495. **PRACTICUM (1-10).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

EARLY CHILDHOOD EDUCATION (CTC)

- 102. **ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfers from other curricula and students pursuing the dual objectives program to understand teacher education and teaching as a profession.
- 104. **ORIENTATION TO LABORATORY EXPERIENCES FOR TRANSFERS (1).** Required of all students completing the Teacher Program. Orientation to the total Laboratory Experiences Program in the School of Education with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program.
- 315. **LANGUAGE DEVELOPMENT: IMPLICATIONS FOR THE CHILDHOOD EDUCATOR (4).** Applications of language development theories to teaching children. Emphasis on effects theories have on curriculum and teaching.
- 320. **CURRICULUM FOR EARLY CHILDHOOD EDUCATION I (10). LEC. 8, LAB. 6. Pr.,** admission to Teacher Education, junior standing. Language Arts and Social Science curricula appropriate for children ages four through eight. Laboratory experiences are required.
- 355. **SURVEY OF EARLY CHILDHOOD EDUCATION (3).** Pr., admission to Teacher Education, junior standing. Survey of the teaching profession, the nature of programmatic variation at the early childhood level.
- 420. **CURRICULUM FOR EARLY CHILDHOOD EDUCATION II (10). LEC. 8, LAB. 6. Pr.,** admission to Teacher Education, junior standing. Mathematics and natural science curricula appropriate for children ages four through eight. Laboratory experiences are required.
- 425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to Internship, appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.
- 446. **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
- 450. **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations normally in small groups.
- 495. **PRACTICUM (1-10).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

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- 620. **EARLY CHILDHOOD EDUCATION PERSPECTIVE (4).** Development of early childhood education as an area in non-school and school settings.
- 621. **ANALYSIS OF EARLY CHILDHOOD EDUCATION PROGRAMS (4).** Pr., CTC 620. Analysis of model programs with distinctive philosophies, theoretical frameworks, goals, materials, and practices.
- 624. **RESEARCH IN EARLY CHILDHOOD EDUCATION (5).** Pr., CTC 621. Review, analysis, and interpretation of research in areas of early childhood education.
- 625. **INTERNSHIP (5-15).** Supervised on-the-job experiences in a school, college, or other appropriate setting, accompanied by regularly scheduled, on-campus discussion periods designed to provide positive evaluation and analysis of this experience.
- 646. **DIRECTED INDEPENDENT STUDY (1-6).** Special study in which the student's learning efforts are guided toward desired objectives, including evaluation by professor and student of work accomplished at regular intervals.

650. **SEMINAR IN EARLY CHILDHOOD EDUCATION (3-10).** May be repeated for credit not to exceed 10 hours.
651. **RESEARCH STUDIES IN EARLY CHILDHOOD EDUCATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. **CURRICULUM AND TEACHING IN EARLY CHILDHOOD EDUCATION (5).** Teaching practices and reappraisal of selected experiences and content for curriculum improvement.
653. **ORGANIZATION OF PROGRAMS IN EARLY CHILDHOOD EDUCATION (5).** Program organization and development of basic and supplementary materials for guiding teachers and school systems in the continuous improvement of curriculum and teaching practices.
654. **EVALUATION OF PROGRAMS IN EARLY CHILDHOOD EDUCATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.

Prerequisites for CTC 651, 652, 653, and 654 are 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

672. **DESIGNING EARLY CHILDHOOD EDUCATION CURRICULA (4).** Pr., CTC 621, CTC 652, and one additional departmental curriculum and teaching course. Application of early childhood history, philosophy, and program analysis to the design of early childhood curriculum.
695. **PRACTICUM (1-15).** Provides advanced students with experiences closely relating theory and practice, usually carried on simultaneously.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
798. **FIELD PROJECT. (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION.** (Student must be enrolled for a minimum of 1 quarter hour of credit from the time the program of studies is filed with the Graduate School until the final examination.)

ELEMENTARY EDUCATION (CTE)

Programs in Elementary Education lead to certification in grades 1-6. Endorsements for Middle School certification, grades 4-8, in certain specific teaching fields are also available.

102. **ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfers from other curricula and students pursuing the dual objectives program to understand teacher education and teaching as a profession.
104. **ORIENTATION TO LABORATORY EXPERIENCES FOR TRANSFERS (1).** Required of all students completing the Teacher Education Program. Orientation to the total Laboratory Experiences Program in the School of Education with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program.
301. **CURRICULUM I (10). LEC. 8, LAB. 6.** Pr., FED 300, admission to Teacher Education, junior standing. Understandings, skills, and attitudes necessary for planning and implementing language arts and social science curricula are developed in an individualized teaching-learning setting. Laboratory experiences are required.
302. **CURRICULUM I, LANGUAGE ARTS (5). LEC. 4, LAB. 3.** Pr., admission to Teacher Education, junior standing.
303. **CURRICULUM I, SOCIAL SCIENCE (5). LEC. 4, LAB. 3.** Pr., admission to Teacher Education, junior standing.
401. **CURRICULUM II (10). LEC. 8, LAB. 6.** Pr., coreq., FED 350 or 400, junior standing. Understanding, skills, and attitudes necessary for planning and implementing elementary mathematics and natural science curricula are developed in an individualized teaching-learning setting. Laboratory experiences are required.
402. **CURRICULUM I, MATHEMATICS (5). LEC. 4, LAB. 3.** Pr., junior standing.
403. **CURRICULUM II, NATURAL SCIENCE (5). LEC. 4, LAB. 3.** Pr., junior standing.
425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to Internship, appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.
446. **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
450. **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations.
451. **ANALYSIS OF ELEMENTARY INSTRUCTIONAL STRATEGIES (3). LEC. 4, LAB. 2.** Pr., Professional Internship. Patterns of elementary curriculum and organization for instruction, including the analysis of previous and current laboratory experiences in education. Attention given to implementation of systems approach in student's area of specialization.
495. **PRACTICUM (1-10).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

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600. **FIRST AND SECOND LANGUAGE ACQUISITION OF THE BILINGUAL CHILD (5).** Language acquisition theories; second language learning; characteristics of the speaker's native language; and psychological and linguistic differences between English and the native language. Review, use, and analysis of language assessment instruments in bilingual education.
625. **INTERNSHIP (5-15).** Provides advanced students with supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled, on-campus discussion periods designed to provide positive evaluation and analysis of the intern experience.
646. **DIRECTED INDEPENDENT STUDY (1-6).** Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
649. **THE ELEMENTARY SCHOOL PROGRAM (5).** Major curriculum areas and teaching practices in the modern elementary school. Attention is given to implications of research and theory for the total elementary school program.
650. **SEMINAR IN AREAS OF SPECIALIZATION (3-10).** May be repeated for credit not to exceed 10 hours. Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.

Each of the following courses, 651, 652, 653, and 654 applies to the following areas of the elementary school program: (G) Language Arts, (H) Mathematics, (K) Science, (L) Social Science, and (S) Bilingual Education.

651. **RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. **CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
653. **ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.

Prerequisites for the 651, 652, 653, and 654 courses are 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

657. **INDIVIDUALIZING INSTRUCTION IN ELEMENTARY SCHOOLS (5).** Analysis of programs for individualizing instruction. Emphasis will be on design, implementation, and management.
695. **PRACTICUM (1-15).** Provides advanced students with experiences closely relating theory and practice, usually carried on simultaneously.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
798. **FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

ENGLISH LANGUAGE ARTS EDUCATION

(See Secondary Education (CTS), and Middle School Education (CTD), below).

FOREIGN LANGUAGE EDUCATION

(See Secondary Education (CTS), and Middle School Education (CTD), below).

JOURNALISM EDUCATION

(See Secondary Education (CTS), below).

MATHEMATICS EDUCATION

(See Secondary Education (CTS), and Middle School Education (CTD), below).

MIDDLE SCHOOL EDUCATION (CTD)

- 401. **TEACHING MATHEMATICS: MIDDLE SCHOOL (4).** LEC. 3, LAB. 2. Specific teaching strategies for a comprehensive middle school mathematics program.
- 419. **THE MIDDLE SCHOOL (5).** LEC. 4, LAB. 3, Pr., FED 300, admission to Teacher Education, junior standing. Historical perspective and rationale for the development of the middle school program. Analysis of middle school organization and selected programs. Laboratory experiences are required.
- 425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to Internship, appropriate professional courses. Supervised teaching in a school, accompanied by scheduled discussions designed to analyze and evaluate the intern's experience.
- 446. **DIRECTED INDEPENDENT STUDY (1-10).** Planned individual inquiry, including evaluation by professor and student at regular intervals.
- 450. **SPECIAL TOPICS (1-5).** Cooperative pursuit of selected concepts and theories, normally in small groups.
- 495. **PRACTICUM (1-10).** Experiences designed to allow individual students to relate theory and practice.

MUSIC EDUCATION (CTM)

Students majoring in music education must demonstrate functional keyboard skills appropriate to their chosen area of concentration. The keyboard proficiency examination is taken prior to enrollment in any CTM course. Additional degree requirements are available from the Dean of Education.

- 102. **ORIENTATION FOR MUSIC EDUCATION STUDENTS (1).** Helps students to understand teacher education and teaching as a profession as well as become acquainted with the preparation program in music education.
- 304. **MUSIC AND RELATED ARTS (3-5).** Pr., MU 371 or equivalent. Musical, rhythmic, and artistic activity program in the context of laboratory experiences with children.
- 394. **TEACHING ELEMENTARY INSTRUMENTAL MUSIC (3).** LEC. 2, LAB. 2. Pr., 6 hours of class instruments. Methodology, materials, and organization for beginning instrumental music programs; includes laboratory experiences with children.
- 396. **EARLY CHILDHOOD AND ELEMENTARY MUSIC PROGRAMS (3).** LEC. 2, LAB. 2. Pr., CTM 304 or COI. Methodology, materials, and activities for music programs in grades N-6; includes laboratory experiences with children.
- 425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to Internship, appropriate professional courses. Provides supervised, on-the-job experiences in school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.
- 446. **DIRECTED INDEPENDENT STUDY (1-10).** Planned individual inquiry including evaluation by professor and student at regular intervals.
- 450. **SPECIAL TOPICS IN MUSIC EDUCATION (1-5).** Cooperative pursuit of selected concepts and theories. May be repeated not to exceed 6 hours.
- 495. **PRACTICUM (1-10).** Experiences designed to allow individual students to relate theory to practice.

ADVANCED UNDERGRADUATE AND GRADUATE

- 593. **MATERIALS AND ORGANIZATION OF SCHOOL ORCHESTRAS (3).** Pr., COI. Administrative procedures, instructional strategies, and materials for intermediate and advanced school orchestra programs.
- 594. **MATERIALS AND ORGANIZATION OF SCHOOL BANDS (3).** Pr., COI. Administrative procedures, instructional strategies, and materials for intermediate and advanced school band programs.
- 595. **MATERIALS AND ORGANIZATION OF SCHOOL CHOIRS (3).** Pr., COI. Administrative procedures, instructional strategies, and materials for school choral programs.
- 596. **CURRENT TRENDS IN EARLY CHILDHOOD AND ELEMENTARY MUSIC (4).** Pr., CTM 396 or COI. Advanced study and evaluation of skills, techniques, materials, theories, and trends in music teaching.
- 597. **MATERIALS AND ORGANIZATION OF GENERAL MUSIC PROGRAMS (4).** Pr., CTM 396 or COI. Scope and sequence of school general music programs with an emphasis on materials and methodologies for post-elementary programs.

GRADUATE

- 611. **KODALY CONCEPT IN AMERICAN MUSIC EDUCATION (4).** Pr., CTM 596 or COI. Theory underlying the Kodaly concept of music education and implications for adaptation to American schools and music literature, with applications to a classroom situation through laboratory experiences.

- 625. **INTERNSHIP (5-15).** Provides advanced students with supervised, on the job experiences in a school or college or other appropriate setting. These experiences will be accompanied by regularly scheduled on-campus discussion periods designed to provide positive evaluation and analysis of the intern experience.
- 646. **DIRECTED INDEPENDENT STUDY (1-6).** Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student at regular intervals.
- 650. **SEMINAR IN MUSIC EDUCATION (3-10).** May be repeated for credit not to exceed 10 hours. Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.
- 651. **RESEARCH STUDIES IN MUSIC EDUCATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
- 652. **CURRICULUM AND TEACHING IN MUSIC EDUCATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
- 653. **ORGANIZATION OF PROGRAM IN MUSIC EDUCATION (5).** Program organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
- 654. **EVALUATION OF PROGRAM IN MUSIC EDUCATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human material resources and the coordination of areas of specialization.

Prerequisites for the 651, 652, 653, and 654 courses are 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

- 695. **PRACTICUM. (1-15).** Students get experiences closely relating theory and practice, usually carried on simultaneously.
- 699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
- 798. **FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

READING EDUCATION (CTR)

- 201. **COLLEGE READING AND STUDY SKILLS (3). LEC. 2, LAB. 2.** General elective. Comprehension skills for college students, including classroom performance skills, reading efficiency techniques, vocabulary development, and study skills. Students will utilize own content area textbooks.
- 370. **FUNDAMENTALS OF READING INSTRUCTION I (5). LEC. 3, LAB. 4.** Pr., sophomore standing. Develops competencies in the teaching of reading. Introduces student to the basic aspects of teaching reading. Fundamental constructs considered are readiness, informal diagnosis, reading skills, planning, approaches, enjoyment of reading, learners with special needs.
- 371. **FUNDAMENTALS OF READING INSTRUCTION II (5). LEC. 3, LAB. 4.** Pr., CTR 370 or COI. Builds on CTR 370 in developing competencies in the teaching of reading. Topics include word recognition, comprehension, and study skills (teaching level); the basal reader and individualized approaches; lesson planning; diagnostic teaching of reading. Commercial materials are evaluated and teacher-made materials are produced. Laboratory experiences with children.
- 446. **DIRECTED INDEPENDENT STUDY (1-10).** Planned individual inquiry, including evaluation by professor and student at regular intervals.
- 450. **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations, normally in small groups.

ADVANCED UNDERGRADUATE AND GRADUATE

- 570. **READING IN THE CONTENT AREAS OF THE ELEMENTARY SCHOOL (5). LEC. 3, LAB. 4.** Pr., CTR 370 and junior standing. Develops competencies in teaching functional reading in the elementary school. Directed reading activities, specialized skills, and study skills stressed.
- 571. **READING IN THE CONTENT AREAS OF THE SECONDARY SCHOOL (5).** Reading problems in content areas of the secondary school and special methods of helping students overcome these problems.
- 574. **PROBLEMS IN IMPROVEMENT OF READING AT THE ELEMENTARY SCHOOL LEVEL (5).** Pr., Teaching experience or COI. An examination of problem areas of effective reading instruction in grades one through nine. Emphasis on phonetic word attack skills, comprehension, vocabulary building, and the use of supplementary materials in the reading program.
- 575. **PROBLEMS IN IMPROVEMENT OF READING AT THE SECONDARY SCHOOL LEVEL (5).** Pr., junior standing or teaching experience or COI. Problem areas of effective reading instruction in developmental reading in grades seven through twelve. Emphasis on techniques and materials for the teaching of comprehension, study skills, vocabulary and other related areas in the reading program and in the content areas of the secondary school.
- 576. **THE READING OF ADOLESCENTS (5).** Pr., CTR 571 or COI. Use of adolescent and popular adult literature in the secondary school reading program. Motivation of the reluctant reader; criteria for evaluating reading materials; and self-selection/self-pacing reading programs in the English or reading classroom.

GRADUATE

630. **THE READING PROCESS (4).** Pr., FED 617 or equivalent. Prominent theories concerning mature reading behavior as reflected in current instructional practices.
640. **DIAGNOSTIC AND CORRECTIVE TEACHING OF READING (4).** Need for diagnostic and corrective procedures in the classroom. Procedures in conducting a diagnosis, including interpretation of results. Nature and causes of reading disability; corrective and remedial procedures, including materials, are examined. Opportunities for diagnosis and corrective/remedial teaching.
641. **DIAGNOSTIC PROCEDURES IN READING (5).** Pr., CTR 661 or COI. Administration, scoring and interpretation of specific reading tests both diagnostic and achievement to determine causes of reading disabilities. Formal and informal evaluation procedures for regular and remedial classrooms. Screening tests for contributing factors to reading disability. Analysis of test information and the implications for correction of reading difficulties.
642. **REMEDIAL PROCEDURES IN READING (5). LEC. 4, LAB. 4.** Pr., CTR 641 or COI. Individual and group techniques for correcting deficiencies and practice in continuing evaluation of reading difficulties. Practice in using special reading equipment and materials with children having reading problems.
646. **DIRECTED INDEPENDENT STUDY (1-6).** Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student at regular intervals.
650. **SEMINAR IN READING EDUCATION (3-10).** May be repeated for credit not to exceed 10 hours. Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.
651. **RESEARCH STUDIES IN READING (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. **CURRICULUM AND TEACHING IN READING (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
653. **ORGANIZATION OF PROGRAM IN READING (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **EVALUATION OF PROGRAM IN READING (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
656. **DIRECTED INDIVIDUAL STUDY IN READING DIAGNOSIS AND READING REMEDIATION (5).** Pr., CTR 642 or COI. Clinical experiences in diagnosing problems in reading and related areas. Also clinical experiences in the remediation of reading problems.
661. **CURRENT THEORY, PRACTICE AND TECHNOLOGY IN READING INSTRUCTION. (4).** Pr., CTR 652 or COI. Current theory, practices, and the impact of technology upon classroom management: cognition, affective and psychomotor development as related to reading.
695. **PRACTICUM (1-15).** Provides advanced students with experiences closely relating theory and practice, usually carried on simultaneously.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than quarter.
798. **FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

SCIENCE EDUCATION

(See Secondary Education (CTS), below and Middle School Education (CTD), above).

SECONDARY EDUCATION (CTS)

Undergraduate students must select two teaching majors unless they select the composite majors offered in English Language Arts, Mathematics, General Science, and Social Studies. These programs lead to certification at the high school level, grades 7-12. Endorsements for certification at the Middle School level, grades 4-8 are also available, as is specific certification at only the Middle School level.

For some courses, there are special sections denoted by a letter code corresponding to the areas of specialization. These areas are: (D) Foreign Language, (G) English, (H) Mathematics, (K) Science, (L) Social Science, and (U) Journalism.

102. **ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfers from other curricula to understand teacher education and teaching as a profession.
104. **ORIENTATION TO LABORATORY EXPERIENCES FOR TRANSFERS (1).** Required of students completing the Teacher Education Program. Orientation to the Laboratory Experiences Program with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program and the Professional Internship.

- 110-111-112. **DEVELOPMENTAL STUDIES 1, 2, 3 (2).** (CREDIT NOT COUNTED TOWARD GRADUATION.) Designed to develop skills conducive to successful college study. Emphasis on reading skills and their relation to other language arts. Attention is given to study skills, communication skills for formal and informal use, and cultural aspects of communication.
201. **EDUCATION (2).** Designed to help prospective teachers in the guidance of students. (A) Art Expression, (J) Music Experiences, (P) Communication Problems, (Q) Materials of Instruction.
- 201L. **EDUCATION (1), LAB. 2.** Laboratory will be taken concurrently with the corresponding lecture course or independent of the lecture.
375. **SCIENCE FICTION IN THE SECONDARY SCHOOL PROGRAM (5).** Selected works of science fiction with emphasis on the use of this genre to augment the teaching in the content areas of the secondary school curriculum.
400. **APPLIED LINGUISTICS FOR FOREIGN LANGUAGE TEACHERS (3).** The Application of linguistics in the teaching of foreign languages.
402. **MATHEMATICS PROGRAM AND TEACHING I (3). LEC. 2, LAB. 2.** Emphases as diagnostic and prescriptive procedures, theories of learning applied to managing and evaluating mathematics programs.
403. **MATHEMATICS PROGRAM AND TEACHING II (3). LEC. 2, LAB. 2.** Emphases are historical bases for school mathematics programs, planning, procedures, instructional strategies, and teaching of problem solving.
404. **TEACHING MATHEMATICS: APPLICATION AND TECHNOLOGY (3). LEC. 2, LAB. 2.** Uses of calculators and computers in school mathematics and the teaching of applications in mathematics.

Each of the following two courses, CTS 405 and 410 is sectioned as follows: (D) Foreign Language, (K) Science, (L) Social Science, and (U) Journalism.

- 405.* **TEACHING IN SECONDARY SCHOOL (3). LEC. 2, LAB. 2.** Pr., FED 350, or COI.
- 410.* **PROGRAM IN SECONDARY SCHOOL (3). LEC. 2, LAB. 2.** Pr., FED 350, or COI.
411. **TEACHING ENGLISH: LANGUAGE AND LINGUISTICS (3). LEC. 2, LAB. 2.** Pr., FED 350, or COI. Specific teaching strategies in language and linguistics.
412. **TEACHING ENGLISH: LITERATURE (3). LEC. 2, LAB. 2.** Pr., FED 350, or COI. Specific teaching strategies in literature.
413. **TEACHING ENGLISH: RHETORIC AND COMPOSITION (3). LEC. 2, LAB. 2.** Pr., FED 350, or COI. Specific teaching strategies in rhetoric and composition.
415. **CURRENT TRENDS AND PRACTICES IN AREAS OF SPECIALIZATION (3). LEC. 2, LAB. 2.** Pr., FED 350, or COI. The study and application of contemporary curriculum and instructional trends and practices within the areas of specialization of the secondary school program.
420. **THE SECONDARY SCHOOL (5).** Current thinking about the organization and purpose of secondary schools.
421. **SOCIAL SCIENCE CONCEPTS AND METHODS (5).** Pr., 25 hours in social sciences. The structure, key concepts, and methods of investigation of the social sciences. Emphasis is placed on those social sciences taught in secondary schools.
425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to Internship, appropriate professional courses. Supervised teaching in a school, accompanied by scheduled discussions designed to analyze and evaluate the intern's experience.
446. **DIRECTED INDEPENDENT STUDY (1-10).** Planned individual inquiry, including evaluation by professor and student at regular intervals.
450. **SPECIAL TOPICS (1-5).** Cooperative pursuit of selected concepts and theories, normally in small groups.
495. **PRACTICUM (1-10).** Experiences designed to allow individual students to relate theory and practice.

*410L is a prerequisite for 405L.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **LANGUAGE STUDY FOR TEACHERS (5).** Linguistics in the school curriculum; the child's acquisition of syntax; theories of teaching usage, dialectology, lexicography, and grammar; English as a second language, non-verbal communication in the classroom; research studies in language and linguistics and their applications to classroom teaching.
502. **RHETORIC AND COMPOSITION FOR TEACHERS (5).** Topics and current trends in teaching rhetoric and composition. Classical and new rhetorics; theories of paragraph analysis; behavioral approaches to composition; pupil motivation and the composing process; current research; evaluation.

GRADUATE

625. **INTERNSHIP (5-15).** Supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences accompanied by regularly scheduled, on-campus discussion periods and evaluation and analysis of the intern experience.
- 640-641. **ADVANCED STUDY OF HIGH SCHOOL GENERAL SCIENCE (5).** Intensive study of selected topics from the area of the high school general science program.
646. **DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
649. **THE SECONDARY SCHOOL PROGRAM (5).** For advanced graduate students. Major curriculum areas and teaching practices in the modern secondary school. Attention given to implications of research and theory for the total secondary school program.
650. **SEMINAR (3-10).** May be repeated not to exceed 10 hours.
651. **RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. **CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
653. **ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
695. **PRACTICUM. (1-15).** Students get experiences closely relating theory and practice, usually carried on simultaneously.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
796. **FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

SOCIAL SCIENCE EDUCATION

(See Secondary Education (CTS), and Middle School Education (CTD).)

Economics (EC)

Professors Hebert, *Head*, Bellante, Chastain,
Ekelund, Jones, Kern, Long, Whitten, and Yeager

Associate Professors Backhaus, Barnett, R. Holcombe, J. Jackson, M. Jackson, and Street
Assistant Professors Ault, Caudill, Garrison, Melese, Saba, Saurman, and Watson
Instructors L. Holcombe and Montgomery

209. **ECONOMICS I (5).** Pr., sophomore standing. Economic principles with emphasis upon the macroeconomic aspects of the national economy. (Credit not allowed for this course and AEC 202.)
202. **ECONOMICS II (5).** Pr., EC 200. A continuation of economic principles with emphasis upon microeconomic aspects of the economy. (Credit not allowed for this course and AEC 206.)
206. **SOCIO-ECONOMIC FOUNDATIONS OF CONTEMPORARY AMERICA (3).** The social and economic developments which promote an understanding of present day American society. (Credit not allowed for this course and EC 202.)
340. **ENVIRONMENTAL ECONOMICS (5).** Pr., EC 202 or COI. Economic analysis applied to topical environmental issues such as pollution, preservation vs. development, economic growth, and population.
350. **LABOR ECONOMICS (5).** Pr., EC 202, junior standing. A theoretical and institutional examination of the labor market, including wage theories, unionism, the economics of collective bargaining, and problems of insecurity.
360. **MONEY AND BANKING (5).** Pr., EC 200 or AEC 202, junior standing. Money, credit and banking including consideration of monetary systems, foreign exchange and commercial banking with relation to the Federal Reserve System.
400. **STUDENT INTERNSHIP PROGRAM (1-10).** Pr., junior standing and selection by the committee directing the School of Business Intern Program.
433. **LAW AND ECONOMICS (5).** Pr., EC 202 or COI, and junior standing. A description of the many substantive areas in which law has an economic foundation and an analysis of the ways in which law affects economic relations.

470. **HONORS THESIS (1-6).** Pr., open only to persons in the University Honors Program and with consent of the student's Honors Adviser.
490. **SPECIAL PROBLEMS (1-10).** Pr., COI, junior standing. May be repeated. Investigation and research into economic problems of special interest to the student and instructor.

ADVANCED UNDERGRADUATE AND GRADUATE

551. **INTERMEDIATE MICROECONOMICS (5).** Pr., EC 202, and junior standing. The theory of pricing under varying market conditions and distribution of income among the factors of production.
552. **COMPARATIVE ECONOMIC SYSTEMS (5).** Pr., EC 202 and junior standing. An analysis of the rival economic doctrines of Capitalism, Socialism, and Communism.
553. **ECONOMICS OF GROWTH AND DEVELOPMENT (DESARROLLO ECONOMICO) (5).** Pr., EC 200 and junior standing, taught in English or Spanish. Concepts, principles and problems of economic growth and development with consideration of appropriate policies for both underdeveloped and advanced economies.
554. **HISTORY OF ECONOMIC THOUGHT (5).** Pr., EC 202 and junior standing. The development of economic ideas, principles, and systems of analysis from early times to the present.
555. **INDUSTRIAL ORGANIZATION (5).** Pr., EC 202 and junior standing. The relationship of market structure to the pricing behavior of business and industry. Selected topics: regulation, research, and development, technological change.
556. **INTERMEDIATE MACROECONOMICS (5).** Pr., EC 202 and junior standing. The measurement of national output, income and employment theory, general equilibrium theory, and theories of interest, investment, and consumption.
557. **ECONOMIC HISTORY OF EUROPE (5).** Pr., EC 200 and junior standing. An analysis of the development of the European economy and the resulting impact on the United States and the world.
558. **ECONOMIC HISTORY OF THE UNITED STATES (5).** Pr., junior standing. The evolution of the American economy from European origins to the present.
559. **REGIONAL ECONOMIC DEVELOPMENT (5).** Pr., EC 200 and junior standing. Analytical discussion of the principles associated with the regional development of a national economy. Emphasis is on the problems of lagging regions and on the experience of the United States.
560. **INTRODUCTION TO ECONOMETRICS (3).** Pr., MH 161 or equivalent, AEC 206 or EC 202 or equivalent, and MN 274 or equivalent; junior standing. Formulation of elementary economic models using economic theory and mathematics with certain basic assumptions or axioms. Mathematical tools used in economic analysis. (Cross listed as AEC 560.)
562. **INTERMEDIATE MONETARY THEORY AND POLICY (5).** Pr., EC 360 and junior standing. Attention given to theoretical and empirical studies. Readings from original sources required.
565. **PUBLIC FINANCE (5).** Pr., EC 202 and junior standing. An examination of the economic rationale of the public sector; supply and demand of public goods. Principles of efficient and equitable taxation and government spending.
568. **BUSINESS HISTORY OF THE UNITED STATES (5).** Pr., junior standing. The origins and developmental patterns of American business with an emphasis on the role of the business community in the economic and political evolution of the United States.
571. **INTERNATIONAL ECONOMICS (ECONOMIE INTERNATIONALE) (5).** EC 200, 202, and junior standing, taught in English or French. An examination of the pure theory and monetary aspects of international trade.
580. **BUSINESS AND ECONOMIC FORECASTING (5).** Pr., EC 200, 202 and MN 274 or COI, and junior standing. Forecasting, with emphasis on the interpretation of macroeconomic forecasting methods and the development of competency in forecasting at the level of the firm.
585. **MATHEMATICAL ECONOMICS (5).** MH 161, EC 551, and 556, and junior standing. An introduction to mathematical methods in economics. Fundamental propositions of micro and macroeconomic theory are derived mathematically.

GRADUATE

501. **FOUNDATIONS OF ECONOMICS (5).** Pr., for non-business students, consent of Director of the MBA Program, School of Business. An accelerated course combining both micro- and macroeconomics and implications for the manager.
602. **MICROECONOMICS I (3).** Pr., EC 551 and graduate standing. Principles of consumer behavior as they apply to economic choice in consumption, exchange, and labor supply.
603. **MICROECONOMICS II (3).** Pr., EC 551 and graduate standing. Principles of producer behavior as they apply to producer choice in production and factor utilization.
604. **MICROECONOMICS III (3).** Pr., EC 602, EC 603. General equilibrium analysis, welfare economics, and other special topics in microeconomic theory.
605. **MACROECONOMICS I (3).** Pr., EC 556 and graduate standing. Evaluation of fundamental theoretical and policy-oriented issues in macroeconomics, emphasizing post-Keynesian developments.
606. **MACROECONOMICS II (3).** Pr., EC 556 and graduate standing. Advanced monetary theory and the neoclassical synthesis.

607. **REGIONAL AND URBAN ECONOMICS (3).** Pr., COI, graduate standing. The economic forces involved in planning a dynamic urban region; the principles and applications of regional economic models.
608. **MACROECONOMICS III (3).** Pr., EC 605, EC 606. Advanced analysis of macrodynamics.
611. **ECONOMIC DEVELOPMENT (5).** Pr., COI, graduate standing. Conceptual and empirical analysis of economic development with emphasis on less developed countries and case studies of development problems.
623. **LABOR MARKET ANALYSIS (3).** Pr., EC 603, or COI. Advanced examination of consumer and producer behavior in labor markets, with special emphasis on recent empirical studies.
624. **HUMAN CAPITAL (3).** Pr., EC 623. Analysis of the causes and consequences of the choices made both by workers and firms to invest in labor.
625. **TOPICS IN LABOR ECONOMICS (3).** Pr., EC 623. Extensive treatment of selected topics in labor market analysis.
633. **ECONOMIC ANALYSIS OF THE LAW (3).** Pr., EC 551. Advanced analysis of the substantive areas in which law has an economic foundation and of the ways law affects economic relations.
634. **ECONOMICS OF REGULATION (3).** Pr., EC 551. An analysis of contemporary theories of economic regulation and examination of empirical evidence on effects of extra-market controls.
635. **TOPICS IN LAW AND REGULATION (3).** Pr., EC 633, EC 634, or COI. Advanced treatment of selected topics in law and regulation of economic activity.
636. **SEMINAR IN INDUSTRIAL ORGANIZATION (3).** Pr., EC 551. Advanced studies in the determinants of market structure and the effects of market structure on industrial activity.
640. **SEMINAR IN ENVIRONMENTAL ECONOMICS (3).** Pr., EC 551. Advanced analysis of pricing and allocation of renewable and non-renewable resources.
650. **ECONOMIC SEMINAR (1-10).** Pr., COI or graduate standing. Intensive study and analysis of selected economic problems.
651. **BUSINESS CONDITIONS ANALYSIS (3).** Pr., EC 501, MN 274 and, for non-business students, consent of Director of the MBA program, School of Business. Macroeconomic theory and business forecasting of the aggregate economy.
655. **HISTORY OF ECONOMIC THOUGHT I (3).** Pr., EC 554 or COI. Analysis and study of classical contributions to economics, from early times through Karl Marx.
656. **PRICE THEORY AND BUSINESS APPLICATIONS (3).** Pr., EC 501, MN 274 and, for non-business students, consent of Director of the MBA program, School of Business. Microeconomic theories of the firm and of markets, with emphasis on their applications to current business issues.
657. **HISTORY OF ECONOMIC THOUGHT II (3).** Pr., EC 554, or COI. Analysis and study of neoclassical contributions to economics, circa 1870 to the present.
658. **SEMINAR IN THE ECONOMIC HISTORY OF THE U.S. (5).** Pr., EC 558, or COI. Recent developments in the field of knowledge constituting the economic history of the U.S.
660. **ECONOMETRICS I (3).** Pr., EC 560 and graduate standing. Probability theory, distribution theory, invariate regression theory, and other problems in economics and statistics.
661. **ECONOMETRICS II (5).** Pr., EC 660. Multivariate regression theory, errors in variables, serial correlation, distributed lags and other problems in economics and statistics.
662. **SEMINAR IN MONEY AND BANKING (5).** Pr., EC 605, or COI. Goals, procedures and achievements in attaining monetary objectives at home and abroad. Special emphasis is given to macro-money models and effects of monetary policy on economic activity.
664. **EXTERNALITIES (3).** Pr., EC 604 or COI. Advanced analysis of pricing and allocation of economic goods when property rights are not well defined.
665. **SEMINAR IN PUBLIC FINANCE (3).** Pr., EC 565 or COI. Advanced microeconomic theory of the public sector.
666. **PUBLIC CHOICE (3).** Pr., EC 665, or COI. Advanced analysis of governmental and other not-for-profit sectors of the economy.
671. **INTERNATIONAL ECONOMICS AND FINANCE (5).** Pr., EC 571. Advanced foreign trade theory and balance of payments analysis, exchange rates, capital movements, financial institutions, and current problems.
690. **SPECIAL PROBLEMS (1-5).** Pr., graduate standing. Variable content in the economics area.
698. **ECONOMICS WORKSHOP (1).** Pr., Advanced graduate standing. Research and discussion of selected topics in economics.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Educational Leadership (EDL)

Professors Tincher, *Head*, Blackburn, Morgan, Pharis, and Walden
Associate Professors Brogdon, Burkhalter, Martin, Scebra, Williams

Prerequisites and corequisites in the Department of Educational Leadership are experience in teaching or appropriate fields and employment or definite professional objectives leading to employment in administration or supervision.

401. **ORGANIZATION AND SUPPORT OF PUBLIC EDUCATION (2).** The organization, administration and financing of American public education.
601. **ORGANIZATION AND ADMINISTRATION OF PUBLIC EDUCATION (5).** For superintendents, principals, teachers and other educational leaders. Topics include purposes of organization and administration; organization and administration on federal, state, and local levels; financial support and accounting; operation of plant; school-community interaction and personnel administration.
603. **SCHOOL FINANCE AND BUSINESS ADMINISTRATION (5).** Relationships between and among educational finance, educational program, tax structures, foundation programs and internal accounting. Theories of public finance and economic principles relating to financial support of educational systems at the local, state and federal levels.
605. **EDUCATIONAL BUSINESS MANAGEMENT (5).** Procedures and practices in educational finance at the business or operational level. Attention to budgeting, accounting, purchasing, transportation, cost analysis, and management of human and material resources.
607. **EDUCATIONAL PLANT MAINTENANCE (5).** Relationship of educational plant maintenance and operation to educational program; procedures in educational plant maintenance and operation; safety factors; trends in modernization and new plant planning.
609. **PERSONNEL ADMINISTRATION (5).** Assists educational leaders with effective personnel administration. Research results and experimentation in morale, welfare, work loads, pupil accounting, and bases for salary determination as they relate to staff and pupil personnel.
612. **CONSTITUTIONAL, STATUTORY AND JUDICIAL FOUNDATIONS OF EDUCATION (5).** The constitutional and statutory provisions for education and an analysis of judicial decisions affecting education. Among topics are authority and responsibility of the teacher; rights, privileges and responsibilities of students; use of school property, taxation; curriculum, contracts and retirement provisions; contractual capacity and liability and transportation.
620. **FUNDAMENTALS OF LEADERSHIP AND SUPERVISION (5).** Introductory studies of the leadership process including such topics as the theoretical framework in which leadership takes place; the purposes, functions and processes of supervision and leadership; administrative and supervisory tasks and skills; and the methods of evaluating leadership and supervisory roles.
621. **ADVANCED STUDIES OF EDUCATIONAL LEADERSHIP AND SUPERVISION (5).** Pr., EDL 620, COI. Advanced study of current theories, concepts and principles of leadership and their in-depth application to educational roles. Emphasis is placed on the responsibility of the educational administrator for effective leadership in the school and community, and the responsibility for leadership in the continuous development and evaluation of staff competence and role performance.
623. **ADVANCED APPLICATION OF INSTRUCTIONAL SUPERVISION THEORY (5).** Pr., EDL 620. Selection and development of supervisory techniques for improvement of classroom instruction; emphasis on interaction analysis, observation techniques, microteaching, team supervision, management by objectives.
625. **INTERNSHIP (5-15).** Provides advanced students with supervised, on-the-job experiences in a school, college, or other appropriate setting. These will be accompanied by regularly scheduled, on-campus discussion periods designed to provide positive evaluation and analysis of the intern experience.
630. **PRINCIPLES OF CURRICULUM AND INSTRUCTION (5).** Pr., FED 647 or COI. Advanced course directed toward providing students the knowledge and skill necessary for deriving principles to guide the processes of planning, designing, and evaluating curriculums in training and educational settings.
631. **CURRICULUM THEORIES (5).** Pr., EDL 630 or COI. Advanced study of major curriculum theories with emphasis on those theories which have special significance in the analysis of contemporary educational practice.
632. **THEORIES FOR DESIGNING INSTRUCTION (5).** Pr., EDL 630, FED 618 or COI. Advanced study and application of theories relating to processes for design of instruction for various educational settings, with emphasis on the development of personalized process models. Attention is given to the relationship of learning and instructional theories.
634. **CURRICULUM AND INSTRUCTION DEVELOPMENT (5).** Pr., EDL 630, EDL 631, and EDL 632. Utilization of curriculum and instruction theories and research for the purpose of developing comprehensive educational programs or courses for various types and levels of organizations.
635. **CURRICULUM AND INSTRUCTION APPLICATION (5).** Pr., EDL 634 and COI. Application of the processes of curriculum and instruction planning, implementation, and evaluation in an existing organization.
640. **EDUCATIONAL PLANT PLANNING (5).** Development of educational plants; relationships between curriculum and plant; trends in plant design; analysis of physical conditions, relationships of professional and lay personnel in educational plant planning.

541. **EDUCATIONAL FORECASTING (5).** Pr., Advanced Statistics Course. A systematic review and analysis of future literature and research and their implications for education. Development and technological forecasting techniques, both quantitative and qualitative. Forecasting of possible futures and identification of possible alternatives.
546. **DIRECTED INDEPENDENT STUDY (1-5).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student at regular intervals.
547. **STUDIES FOR COMPREHENSIVE EDUCATIONAL PLANNING (5).** Principles and procedures for collecting, analyzing, and utilizing data in the process of educational planning, including such topics as community characteristics, including power structure; economic bases and population; system characteristics, including administrative organization, finance, personnel, physical facilities, and instructional program.
550. **SEMINAR IN AREA OF SPECIALIZATION (1-10).** Advanced graduate students and professors pursue cooperatively selected concepts and theoretical formulations.
552. **CURRENT PROBLEMS AND ISSUES IN EDUCATIONAL ADMINISTRATION (5).** The problems, issues, and trends affecting educational institutions with particular attention to development of administrative procedures to cope with the extensive changes occurring in education.
560. **ORGANIZATION AND ADMINISTRATION OF HIGHER EDUCATION (5).** Pr., EDL 663 or 665. For educational leaders in higher education. The organization, administration, and evaluation of institutions in higher education in terms of the academic program, student personnel services, business affairs, and related programs including relations between higher education and the state and federal government.
563. **THE AMERICAN COLLEGE AND UNIVERSITY (5).** Philosophy and function, the university and social change, the community college, academic freedom, student-faculty-community relationships; international flow of educational ideas, government cultural programs, higher education and the state.
565. **THE COMMUNITY COLLEGE (5).** The rise and development of the community/junior college in American education; its history, philosophy, and functions.
566. **UNDERGRADUATE INSTRUCTION IN HIGHER EDUCATION (5).** Pr., EDL 663 or 665 or COI. The development and selection of appropriate curricular materials and effective teaching strategies. Evaluation of instruction and learning effectiveness in undergraduate programs of higher education.
567. **PROBLEMS OF TEACHING THE marginally PREPARED COLLEGE STUDENT (5).** Pr., EDL 665, 666 or COI. Socioeconomic and cultural backgrounds as they affect learning styles of the marginally prepared student. Develop methods of appropriate teaching strategies as a means of improving the self-concept of these students.
568. **THE COMMUNITY COLLEGE PROGRAM (5).** The comprehensive community-junior college designed to improve competencies in program planning, evaluation, and administration.
569. **STUDENT PERSONNEL WORK IN HIGHER EDUCATION (5).** Pr., CED 621. Theories, principles, practices, organization, administration, and evaluation of student personnel services in higher education.
585. **ADMINISTRATIVE ORGANIZATION AND BEHAVIOR (5).** Current theories and concepts of formal organization and of collective behavior. Includes a social-psychological approach to organizations, and treats current trends in organizing of instruction.
586. **ADMINISTRATION AND POLICY FORMATION (5).** Analysis of basic social forces, antecedent movements, and political action leading to formal enactment of educational policy at national, state, and local levels. Consideration is given to the roles and functions of governing and regulating boards and agencies.
595. **PRACTICUM (1-15).** Students get experiences closely relating theory and practice, usually carried on simultaneously.

EDL courses 660, 663, 665, 666, 667, and 669, along with CED 653, and CED 654, constitute a core for the development of programs of study in higher education. Other offerings, in both academic and professional fields, are available for the completion of advanced programs. These include educational leadership; foundations of education; psychology; student personnel; vocational and technical education; professional and academic preparation for teaching in agricultural sciences; business administration, economics and sociology, English, health and physical education, history, home economics, mathematics, music, philosophy, physical and biological sciences, and speech.

The following research/field project credit options are available in each department according to the levels of degree study offered in the department.

599. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
798. **FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Educational Media (EM)

Associate Professors Wright, Head, Miller, Nist, and Robison
 Assistant Professor Countermine
 Instructors Boland and Gibbs

The programs in Educational Media may provide for certification at the A level and AA level for media specialists. Many courses are open to graduate level majors in other program areas of the school and the university.

The Instructional Design program in Educational Media emphasizes the application of instructional design technology, including computers, into the learning process. These courses are open to training directors in industry, business, and the military as well as specialists in education.

200. **EDUCATIONAL MEDIA (2). LAB. (4).** Basic principles of library/media center usage includes audiovisual equipment operation, production of basic AV materials, and retrieval and utilization of library materials.
370. **MICROCOMPUTER CONCEPTS AND APPLICATIONS IN EDUCATION (4). LEC. 3, LAB. 2.** An introduction to microcomputer uses in education.

ADVANCED UNDERGRADUATE AND GRADUATE

500. **MEDIA RESOURCES PLANNING AND PRESENTATIONS (4). LEC. 2, LAB. 4.** Pr., junior standing, EM 200, or COI. Selecting planning, preparing, and presenting media resources, including access and selection, using materials and equipment, producing materials, planning presentations, and validating use of resources.
510. **MEDIA FOR CHILDREN (4).** Pr., junior standing. Evaluation of print and other types of materials in view of the needs and interests of various age and grade levels of elementary school children. Study of selection aids, principles, and criteria for selecting materials.
515. **MEDIA FOR YOUNG ADULTS (4).** Pr., junior standing. Evaluation of books and other media in relation to the interests, needs, and abilities of young adults.
530. **REFERENCE MATERIALS AND SERVICES (4).** Evaluation of basic reference sources for learning resource centers. Introduction to research methods needed in locating information to support the curriculum of the school.
540. **ORGANIZATION AND ADMINISTRATION OF MEDIA CENTERS (4).** Pr., EM 500 or concurrent with EM 500. Basic organization of books, non-book materials, and services for effective use in media centers. Administering the budget, selection and purchase of materials, preparation of materials for use, circulation of materials, inventory, care and repair of materials, and instruction in the use of media are considered.
550. **CLASSIFICATION AND CATALOGING OF MEDIA (4).** Principles and procedures of classifying and cataloging books and other printed materials, filmstrips, recordings, and community resources. The vertical file, the Dewey decimal system of classification, Wilson and Library of Congress printed cards, and subject headings are studied.
570. **THE MICROCOMPUTER AS AN EDUCATIONAL MEDIUM (4). LEC. 3, LAB. 2.** Pr., junior standing. Applications of present and future uses of computers in education including instructional and administrative uses, modeling, simulation, terminology and existing resources.
580. **COMPUTER-BASED EDUCATION: PROGRAMMING SYSTEMS (4).** Pr., EM 570 or COI. Programming a microcomputer in the BASIC language with an emphasis on educational applications.

GRADUATE

600. **TECHNOLOGY IN EDUCATION (4).** Pr., EM 300 or equivalent. Theory, problems, procedures, and standards in the utilization of technology.
605. **MODES OF MEDIATED INSTRUCTION (4).** Pr., EM 600. Development and integration of media into learning prescriptions. Emphasis is on the selection of appropriate media for specific learning tasks.
610. **SELECTION AND USAGE OF MEDIA FOR YOUTH (4).** Pr., EM 510, 515, or COI. Evaluation, selection, and use of print and non-print media for children and young adults, including materials for multicultural, special, gifted education.
620. **PROGRAMS AND PRINCIPLES OF MEDIA SERVICES (5).** Pr., EM 540 or COI. Place and function of media services in school programs. Functions of school media personnel in leadership and principle application in media program development. Course work includes Practicum experience.
625. **INTERNSHIP (3-15).** Provides advanced students with supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled, on-campus discussion periods to provide positive evaluation and analysis of the intern experience.
626. **PROBLEMS IN THE ADMINISTRATION OF MEDIA SERVICES (4).** Pr., EM 605, 620, or COI. Current problems relating to an effective program of media services. Experiences include problem identification and resolution in the field.
630. **COMMUNITY INFORMATION AND REFERENCE SOURCES (4).** Pr., EM 530. The use of reference sources, information networks, community surveys and group decision-making in relating school media programs to the community.

646. **DIRECTED INDEPENDENT STUDY** (1-10). Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
650. **SEMINAR IN EDUCATIONAL MEDIA** (1-10). May be repeated for credit not to exceed 10 hours. Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and/or theoretical formulations.
651. **RESEARCH STUDIES IN EDUCATIONAL MEDIA** (4). Pr., FED 661 and 18 hours of appropriate media courses including EM 600 or equivalent. Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
654. **EVALUATION OF PROGRAM IN EDUCATIONAL MEDIA** (4). Pr., FED 661 and 18 hours of appropriate media courses including EM 600 or equivalent. Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
670. **COMPUTER-BASED EDUCATION: AUTHORING SYSTEMS** (4). LEC. 3, LAB. 2. Pr., EM 570 and EM 600, or COI. Design, development, and implementation of computer-assisted instructional software.
695. **PRACTICUM** (1-15). Experiences closely relating theory and practice, usually carried on simultaneously.
696. **GRADUATE RESEARCH FORUM** (1). May be repeated but counted only once toward graduation. Presentations by graduate students of research proposals and/or findings. Analysis of procedures and findings.
699. **RESEARCH AND THESIS**. (CREDIT TO BE ARRANGED.) May be taken more than one quarter.
798. **FIELD PROJECT**. (CREDIT TO BE ARRANGED.) May be taken more than one quarter.

Electrical Engineering (EE)

Professors Irwin, Head, Aldridge, Boland, Carroll, Graf,
Lowry, Phillips, Russell, Shumpert, and Weaver
Alumni Professor Jaeger
Georgia Power Professor Grigsby
Adjunct Professor Honnell
Associate Professors Feaster, Nelson, Rogers, and Slagh
Square-D Associate Professor Gross
Assistant Professors Arroyo, Baginski, Daneshvar, James, and Tzeng
Adjunct Associate Professors Barnes, Davidson, and Schiffman
Instructor Nelms

General Curriculum (GC) students (those with undeclared majors) may enroll only with departmental consent.

201. **INTRODUCTION TO COMPUTER PROGRAMMING** (3). Pr., MH 163. An introduction to the Basic computer languages with emphasis on the use of the digital computer as an engineering tool.
261. **LINEAR CIRCUIT ANALYSIS I** (3). Pr., PS 221, EE 201 or an equivalent programming course. Coreq., MH 165. Basic laws and concepts; resistive circuits, linear algebra, R-L and R-C circuits.
263. **LINEAR CIRCUIT ANALYSIS II** (4). Pr., EE 261. Coreq., EE 264 for EE students. Sinusoidal forcing functions and phasors; steady-state response, average power and RMS values, polyphase circuits, and magnetically coupled circuits.
264. **LINEAR CIRCUIT ANALYSIS II LABORATORY** (1). LAB. 3. Coreq., EE 263. Experiments in electrical circuits.
301. **ENGINEERING INSTRUMENTATION** (3). LEC. 2, LAB. 3. Pr., EE 263 or EE 302. Principles of instrumentation. The detection and measurement of physical quantities with emphasis on transducers, signal processing, and display. (Not open to Electrical Engineering majors.)
302. **INTRODUCTION TO ELECTRICAL ENGINEERING I** (3). Pr., PS 221, coreq., MH 265. Electrical circuit analysis — dc, ac, and transient; power devices and systems.
303. **INTRODUCTION TO ELECTRICAL ENGINEERING II** (3). Pr., EE 302. Digital systems; electronic devices; amplifier concepts.
330. **ANALYSIS AND DESIGN OF LOGIC CIRCUITS** (4). LEC. 3, LAB. 3. Pr., EE 201. Binary numbers; Boolean algebra, Boolean functions, truth tables and Karnaugh maps; Gates and flipflops; combinational and sequential logic circuits; design methods and design verification; logic families and logic technologies.
335. **COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE PROGRAMMING** (4). LEC. 3, LAB. 3. Pr., EE 330. Stored program computers, hardware components, software components; data representation and number systems; instruction sets, addressing modes, and assembly language programming; subroutines and macros; assemblers; loaders, linkers, and operating systems; memory, memory cycle and memory hierarchy; arithmetic/logic unit; control unit, program counter, and instruction cycle; input/output, input/output programming, and interrupts. (Credit is not allowed for both EE 335 and CSE 335.)
340. **COMMUNICATIONS I** (3). Pr., EE 362. Fourier series, Fourier Transforms, spectral analysis, amplitude and angle modulation, frequency division multiplexing.

341. **COMMUNICATIONS II (4).** LEC. 3, LAB. 3. Pr., EE 340, IE 311. Pulse modulation, time-division multiplexing, random processes, correlation analysis, power spectra, information and digital transmission, quantization noise, digital modulation: ASK, PSK, FSK; introduction to digital signal processing.
351. **LINEAR FEEDBACK SYSTEMS (4).** Pr., EE 362 or COI for non-EE students. Transfer functions, transient and steady state performance, stability, design and compensation of feedback control systems.
352. **DISCRETE AND NONLINEAR CONTROL SYSTEMS (4).** LEC. 3, LAB. 3. Pr., EE 351. Analysis and design of discrete control systems, with emphasis on digital control systems; describing functions; state-plane analysis.
362. **LINEAR SYSTEMS (5).** LEC. 4, LAB. 3. Pr., MH 266, EE 263, 264. Fourier Series, Fourier transforms, Laplace transforms.
371. **ELECTRONICS I (3).** Pr., EE 263 or 302. Semiconductors, principles of electronic devices, design of low frequency electronic circuits.
374. **ELECTRONICS II (4).** Pr., EE 371. Integrated circuits, high frequency limitations of electronic devices, frequency response, feedback, design of high frequency and feedback electronic circuits.
385. **POWER SYSTEM ANALYSIS I (4).** Pr., EE 263 or 302. Basic power system terminology. Synchronous machines, transmission lines, and transformer system models. Symmetrical components and load flow analysis.
391. **ELECTROMAGNETIC PRINCIPLES I (3).** Pr., PS 221, PS 222, MH 265. Scalar and vector fields, Coulomb's and Gauss' laws, the electrostatic field, Biot-Savart's and Ampere's laws, the magnetostatic field, Laplace's and Poisson's equations, coordinated classroom and laboratory demonstrations.
392. **ELECTROMAGNETIC PRINCIPLES II (3).** Pr., EE 263, EE 391. Faraday's law, electrodynamics, Maxwell's equations, the wave equation and its solution, wave reflection, refraction, and diffraction, transmission lines concepts, coordinated classroom and laboratory demonstrations.
397. **INTRODUCTION TO ACOUSTICS AND NOISE CONTROL (3).** Pr., MH 265 or COI. Terminology and units, hearing loss, regulations, instrumentation, noise sources, room acoustics, walls, enclosures, barriers, acoustical materials and vibration control.
430. **COMPUTER SYSTEM DESIGN (4).** LEC. 3, LAB. 3. Pr., EE 335. Computer I/O, I/O hardware, programmed I/O, interrupts, DMA, and I/O programming; microprocessors, support chips, peripherals, and programming; system specification, design, and verification.
475. **ELECTRONICS III (5).** LEC. 4, LAB. 3. Pr., EE 330, 374. Oscillators, IC operational amplifiers, linear analog systems, nonlinear analog systems, IC logic families, power circuits.
481. **ELECTROMECHANICAL ENERGY CONVERSION (5).** Coreq., EE 385. Basic concepts in electromagnetic-mechanical energy conversion. Linear and nonlinear analysis of transformers, dc machines, synchronous, and induction machines. Operation in the generator and motor modes.
489. **ELECTROMECHANICAL ENERGY CONVERSION LABORATORY (2).** LAB. 6. Coreq., EE 481. Experiments involving electromechanical energy conversion devices.
490. **SPECIAL TOPICS. (CREDIT TO BE ARRANGED.)** Pr., COI. May be taken more than one quarter.
492. **APPLIED ELECTROMAGNETICS (4).** LEC. 3, LAB. 3. Pr., EE 392. Analysis and design of commonly-used waveguides and guided-wave structures and devices. Introduction to and design of simple antennas and other radiating structures. Coordinated classroom demonstrations and laboratory experiments.
493. **INTRODUCTION TO ELECTROMAGNETIC COMPATIBILITY AND INTERFERENCE (3).** Pr., EE 362, 371, 392. Electrical noise suppression and control in electrical systems.
494. **RADAR SYSTEMS (3).** Pr., EE 392. Introduction to the fundamentals of radar systems.
495. **MICROWAVE COMPONENTS AND SYSTEMS DESIGN (3).** Pr., MH 266, EE 492. Design guidelines for microwave systems including waveguides, waveguide devices, microwave sources including klystrons, magnetrons, TWT's, and solid-state devices. Coordinate homework design projects and classroom demonstrations and presentations.
496. **DESIGN OF ANTENNAS AND ANTENNA SYSTEMS (3).** Pr., MH 266, EE 492. Design of antenna elements and phased arrays of these elements, antenna system performance parameters and guidelines, antenna measurements and measurement systems.
498. **HONORS THESIS (1-6).** Pr., COI and department head approval. Individual student endeavor consisting of directed research and writing of honors thesis. (EE Honors Program students only. May be repeated once for a maximum of 6 total credit hours.)
499. **SPECIAL PROJECTS. (CREDIT TO BE ARRANGED.)** Pr., COI. May be taken more than one quarter.

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516. **ERROR DETECTING AND CORRECTING CODES (3).** LEC. 3, LAB. 3. Pr., EE 430, MH 371. An introduction to practical methods for implementing error codes in computer and data-communication systems. Techniques are demonstrated in the laboratory.
520. **ROBOTICS AND MACHINE INTELLIGENCE LABORATORY (2).** LAB. 6. Pr., EE 521 or EE 524. Students design and implement solutions to robotic experiments using a laboratory robot system and do an application project.
521. **MACHINE INTELLIGENCE AND ROBOTICS I. (4).** LEC. 3, LAB. 3. Pr., EE 430, COI. Software and hardware pertaining to the design of intelligent computer systems. Problem representation, game playing, State space search techniques, problem reduction search techniques, Mini Maxing-Alpha Beta Pruning; sensors, transducers optics; automatic controllers, numeric controller machines, industrial and research robots.

522. **MACHINE INTELLIGENCE AND ROBOTICS II — APPLICATIONS (3).** Pr., EE 521. Applications in machine intelligence, problem-solving paradigms, image understanding, natural language understanding, automatic reasoning, blocks world robot manipulations, question-answering systems, knowledge representation, expert machines, and rule-based deduction systems.
523. **FAULT DIAGNOSIS OF DIGITAL SYSTEMS (3).** Pr., EE 430 and COI. Fault testing for combinational and sequential logic circuits, fault models, test generation, diagnosis of logic systems, implications in design.
524. **MICROCOMPUTERS (3).** Pr., EE 430 or COI. Microcomputer chip sets, microcomputer system design, machine programming, PROM programming, interfacing, applications, bit-sliced microprocessors, advanced microprocessor/microcomputer architectures.
525. **MICROCOMPUTER DESIGN LABORATORY (3).** LEC. 1, LAB. 6. Coreq., EE 524 or COI. Students design and build a microcomputer system and do an application project with the system.
526. **MICROCOMPUTER DESIGN PROJECTS LABORATORY (2).** LAB. (6). Pr., EE 430 and COI. Individual projects are defined and implemented related to microcomputer hardware and/or software.
527. **DESIGN OF COMPUTER STORAGE SYSTEMS (3).** Pr., EE 430. Design of dynamic and static memory systems; magnetic recording for disk and tape; floppy and hard disk controllers; and magnetic bubble memories.
528. **COMPUTER INTERCONNECTION STANDARDS (3).** Pr., EE 430. Design and characteristics of standard microcomputer buses. Low-level computer network interfacing and design. Instrumentation bus design and operation.
530. **COMPUTER ARCHITECTURE AND DESIGN I (4).** Pr., EE 430. Structural organization and hardware design of digital computers; register transfers; micro-operations, control units and timing; instruction set design; microprogramming; automated hardware design aids. (Credit is not allowed for both EE 530 and CSE 530.)
531. **DISTRIBUTED DATA PROCESSING I (3).** Pr., EE 530 or equivalent. Overview of distributed data processing concepts; hardware architectures and configurations; system and application software design; problem design; interprocess communication; system performance evaluation; fault tolerance. Decentralized control, distributed operating systems, and distributed databases. (Credit is not allowed for both EE 531 and CSE 531.)
533. **PARALLEL AND CONCURRENT PROCESSING (3).** Pr., EE 530 or equivalent and CSE 500. Hardware and software elements of multiprocessors, multicomputers, pipeline and array machines, and data flow architecture; design principles related to machine structures, control software and hardware, data storage and access, programming, languages, and application algorithms. (Credit is not allowed for both EE 533 and CSE 533.)
547. **DIGITAL FILTERS AND SIGNAL PROCESSING — DESIGN (5).** LEC. 4, LAB. 3. Pr., EE 341 and EE 352. The digital processing of signals, digital filters, the discrete and the Fast Fourier transform, discrete random signals, power spectrum estimation, and autocorrelation analysis.
551. **THE DESIGN OF ANALOG AND DIGITAL COMPUTER SIMULATIONS OF PHYSICAL SYSTEMS (5).** LEC. 3, LAB. 6. Coreq., EE 352. Analog and Digital Computer simulation of physical systems; optimization techniques for design; parameter variation to achieve design objectives.
552. **MODERN DIGITAL CONTROL SYSTEMS DESIGN (3).** Pr., EE 352. Linear algebra, state variable modeling, pole assignment design, optimal design, design of state estimators.
553. **MICROPROCESSOR CONTROL SYSTEMS DESIGN (5).** LEC. 4, LAB. 3. Pr., EE 430. Coreq., EE 352. Electrical transducers. Characteristics of operational amplifiers used for instrumentation. Signal conditioning operations. Data conversion systems. Signal transmission methods. Process controllers. Microprocessor controller examples.
554. **LINEAR SYSTEMS WITH RANDOM SIGNAL INPUTS (4).** Pr., EE 311. Coreq., EE 352. Review of probability and random variables, random signals, analog and discrete system response to random signals, Monte Carlo simulations.
570. **ELECTRICAL PROPERTIES OF MATERIALS (3).** Pr., EE 391, PS 320. Studies of the electrical properties of materials with emphasis on semiconductors.
571. **PHYSICAL ELECTRONICS (3).** Pr., EE 570. Physical properties of electrical and electronic devices.
572. **MICROELECTRONICS — FABRICATION AND DESIGN (3).** Pr., EE 374. Coreq., EE 573. Monolithic integrated circuit technology, thick and thin film hybrid circuits, fabrication and applications.
573. **MICROELECTRONICS LABORATORY (1).** LAB. 3. Coreq., EE 572. Experiments in microelectronics technologies.
574. **INTRODUCTION TO NOISE IN ELECTRONICS (3).** Pr., EE 374, 391, PS 320. Noise in solid state devices and circuits, low noise circuit design, noise characterization, and computer-aided noise analysis.
575. **LINEAR INTEGRATED CIRCUIT DESIGN (3).** Pr., EE 374. Design of analog circuits; current sources, input/output states, gain stages, multipliers, multiplexers, phase-locked-loops active filters.
576. **DIGITAL INTEGRATED CIRCUIT DESIGN (3).** Pr., EE 374. Design of digital integrated circuits, applications, solid state device switching characteristics, memory, displays, testing.
581. **APPLICATIONS AND DESIGN OF ELECTROMECHANICAL SYSTEMS (3).** Pr., EE 481 or COI. Transformer Connections. NEMA and IEEE Motor Standards. Matching motors to cyclic loads. Machine transient analysis.
582. **POWER ELECTRONICS (3).** Pr., EE 481 or COI. Polyphase power rectifiers and inverters. Solid state drives for rotating machines. Characteristics of high power solid state components.
585. **POWER SYSTEM ANALYSIS II (3).** Pr., EE 385 or COI. Symmetrical components and analysis of unbalanced faults on power systems. Relay and protection schemes.

586. **DIRECT ENERGY CONVERSION (3).** Pr., EE 481, 391, ME 301, COI. Fundamentals and energy consideration thermoelectric devices, photovoltaic devices, thermionic devices, magnetohydrodynamic power generation, batteries and fuel cells. Ecological consideration.
588. **POWER SYSTEM PLANNING AND DESIGN (3).** Pr., MH 266, EE 385, or COI. Reliability techniques applied to the planning and design of generation, transmission, and distribution facilities of electrical power systems.
590. **SPECIAL TOPICS. (CREDIT TO BE ARRANGED.)** Pr., COI. May be taken more than one quarter.

GRADUATE

601. **LINEAR ANALYSIS (5).** Methods of analysis, the exponential forcing function, Fourier series, Fourier transform, Laplace transform, and superposition integrals. Complex variables and contour integration.
620. **NONDETERMINISTIC SYSTEMS ANALYSIS (3).** Pr., COI. Applications of probability, random variables, and stochastic processes in Electrical Engineering.
621. **SWITCHING THEORY I (4).** Pr., EE 330 or equivalent. Special topics in switching theory and digital design. Multiple level circuits, decomposition, threshold and multiple-valued logic, linear sequential circuits, and issues in asynchronous sequential circuit design.
622. **SWITCHING THEORY II (4).** Pr., EE 621 or equivalent. Algebraic structure of sequential machines; modular logic design, universal logic modules, array realizations, programmable logic arrays, physical circuit design, partitioning, placement, routing; magnetic bubble logic; fault diagnosis; fault-tolerant design.
623. **CODING THEORY (3).** Pr., EE 330. Error detection and correction, linear codes, cyclic codes, BCH codes, coding bounds, shift register sequences, and coding systems.
626. **ADVANCED COMPUTER ARCHITECTURE (3).** Pr., EE 530 or equivalent. Computer architecture and design principles; computer structures, partitioning; pipelining; vector processing; multi-processing; and case studies. (Credit is not allowed for both EE 626 and CSE 627.)
627. **SPECIAL TOPICS IN COMPUTER ARCHITECTURE (3).** Pr., EE 626 or equivalent. Current topics in developing computer architecture, with emphasis varying according to research interest. (Credit is not allowed for both EE 627 and CSE 631.)
631. **DISTRIBUTED DATA PROCESSING II (3).** Pr., EE 531 or equivalent, or COI. Advanced topics in distributed data processing, including decentralized control and distributed operating systems, fault tolerance techniques for distributed systems, dynamic reconfiguration of resources, and applications of distributed networks. (Credit is not allowed for both EE 631 and CSE 631.)
632. **REAL TIME COMPUTING SYSTEMS (3).** Pr., EE 530 or equivalent, or COI. Requirements and application of real time computing: architecture, control, resource allocation, data storage and access, design, implementation, and testing. (Credit is not allowed for both EE 632 and CSE 632.)
633. **SPECIAL PURPOSE COMPUTING SYSTEMS (3).** Pr., EE 530 or equivalent, or COI. Special purpose computing devices, including residue number processors, instruction set architecture, optical data processing, logic enhanced memory devices, and other special purpose computational structures. (Credit is not allowed for both EE 633 and CSE 633.)
636. **COMPUTER NETWORKS AND DATA COMMUNICATIONS (3).** Pr., EE 430 or COI. Introduction to distributed systems, network architectures, protocols, digital communication links, data management, and related software design. (Credit is not allowed for both EE 636 and CSE 636.)
640. **THEORY OF CONCURRENT SYSTEMS (3).** Pr., EE 626 or equivalent. The theory of concurrent computer architectures and research in multiple processor computing environments. (Credit is not allowed for both EE 640 and CSE 640.)
641. **SPECTRAL ANALYSIS AND OPTIMUM FILTERING (3).** Pr., EE 620. Noise processes, correlation, power spectra, noise through linear systems, matched filters, Wiener filters, pre-whitening, and parameter optimization.
642. **FAULT TOLERANT COMPUTING (3).** Pr., EE 530 or equivalent, or COI. Architecture and design of fault tolerant computer systems using protective redundancy, estimation of the reliability and availability of fault tolerant systems, error recovery, and fault diagnosis. (Credit is not allowed for both EE 642 and CSE 642.)
643. **DESIGN OF EXPERT COMPUTER SYSTEMS (3).** Pr., EE 522. The power of knowledge to solve complex problems, knowledge structures, control strategies. Semantic nets, scripts, stereotypes, and frames. Overview of expert systems, architectures, tools, construction, evaluation, and reasoning about its own problem domain. Case studies: Mycin, Sophie, OPS, and Hearsay. Tools: Emynin, KRL, KAS, Interlisp.
644. **TOPICS IN ARTIFICIAL INTELLIGENCE AND ROBOTICS (3).** Pr., EE 522. Advanced practical applications of Artificial Intelligence in any or all of the following areas: textual data manipulation and automatic inferencing, computer vision, natural language understanding, perception, learning, AI machines and architectures, advanced problem solving systems, automatic reasoning, and robotics.
645. **DIGITAL IMAGE PROCESSING (3).** Pr., EE 547. Human visual system, digital images as two dimensional signals, two dimensional Fourier transform and linear filtering, image enhancement and restoration, edge detection and image feature extraction, image understanding, image coding.
646. **PATTERN RECOGNITION (3).** Pr., EE 547. Decision functions, distance measures and clustering, Bayes and minimax pattern classifiers, preprocessing and feature extraction, syntactic pattern recognizers, survey of applications.

647. **THEORY OF DIGITAL SIGNAL PROCESSING (3).** Pr., EE 547. Finite and infinite impulse response digital filters, finite word length effects, two dimensional signal processing hardware schemes and applications.
- 648-649. **DETECTION, ESTIMATION AND MODULATION THEORY I-II (3-3).** Pr., EE 641 or COI. Hypothesis testing, parameter estimation, detection and estimation of parameters in Gaussian noise, linear estimation, optimum demodulation.
- 650-651. **ADVANCED ELECTROMAGNETIC THEORY I-II (3-3).** Pr., COI. A two course sequence for students specializing in electromagnetics.
670. **INFORMATION THEORY (3).** Pr., EE 620. Information measures, channel models and channel capacity, coding theorems, and rate distortion functions.
671. **SOLID STATE ELECTRONICS I (3).** Pr., EE 570 or COI. Transport properties of semiconductors, band structure, carrier lifetime, current flow, junction theory.
672. **SOLID STATE ELECTRONICS II (3).** Pr., EE 571 or COI. Advanced physical theory of pn junctions and bipolar junction transistors, modeling theory, high level injection effects, large signal analysis, and second order effects.
- 673-674. **COMMUNICATION SYSTEMS I-II (3-3).** Pr., COI. RF circuitry; impedance matching networks; oscillators; mixers; modulators; detectors; RF amplifiers; high frequency devices; integrated subsystems; testing and measuring techniques in RF systems.
675. **ANALOG ELECTRONIC CIRCUITS (3).** Pr., COI. Analysis, design, and application of discrete and integrated electronic devices in analog circuitry. Amplifiers; active filters; integrators; multipliers; dividers; logarithmic converters. Speed capability and noise considerations.
- 677-678. **ELECTRONIC SWITCHING CIRCUITS I-II (3-3).** Pr., COI. Analysis, design, and application of discrete and integrated electronic devices in switching circuitry. Wave shaping; integrated circuit logic families; gating; wave generation; counting; timing; memory.
679. **SOLID STATE ELECTRONICS III (3).** Pr., COI. Advanced theory of field effect devices.
680. **DIRECTED READING IN ELECTRICAL ENGINEERING. (CREDIT TO BE ARRANGED.)**
681. **STATE-VARIABLE ANALYSIS OF SYSTEMS (4).** Pr., COI. Matrices and linear spaces; state variables for linear continuous systems; applications in analysis and design of control systems.
682. **DIGITAL CONTROL SYSTEMS (4).** Pr., COI. State variable description for discrete systems; analysis of digital control systems; design by classical methods.
683. **NONLINEAR CONTROL SYSTEMS (4).** Pr., COI. State plane; describing functions; Lyapunov methods.
684. **MODERN CONTROL THEORY (4).** Pr., COI. Design by pole assignment; observers; optimal control; Kalman filters. Emphasis on discrete control.
685. **POWER TRANSMISSION LINES (3).** Pr., EE 385 or COI. Derivation of line parameters, including ground effects and overhead neutrals. a, B, O components. Line performance including lightning and switching transients. Surge arrester applications.
686. **POWER SYSTEM OPERATION AND CONTROL (3).** Pr., 385 or COI. Economic Dispatch and Unit Commitment. Automatic Generation Control (AGC). The P-f control loop. The Q-V control loop. Kron's Methods for loss considerations.
687. **POWER SYSTEM STABILITY (3).** Pr., EE 385 or COI. Definitions of steady state, dynamic, and transient stability. H constants. The swing equation. Synchronous models. Multimachine systems.
688. **GENERALIZED MACHINE THEORY (3).** Pr., EE 481 or COI. Linear coordinate transformations. The generalized machine. Dynamic and steady state performance.
690. **SPECIAL TOPICS. (CREDIT TO BE ARRANGED.)** Pr., COI. May be taken more than one quarter.
694. **MODERN CONTROL THEORY APPLICATIONS (4).** Pr., EE 684. Advanced practical aspects of optimal control and estimation theory.
695. **SEMINAR. (CREDIT TO BE ARRANGED.)** Pr., COI. May be taken more than one quarter.
698. **SPECIAL PROJECTS. (CREDIT TO BE ARRANGED.)** Pr., COI. May be taken more than one quarter.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Engineering (EGR)

General Curriculum (GC) students (those with undeclared majors) may enroll only with departmental consent.

For other engineering courses, refer to individual departmental course offerings.

450. **ENGINEERING HONORS (1).** May be taken for no more than two quarters. Pr., junior standing. Open to Honors Program students only.
491. **LEGAL ASPECTS OF ENGINEERING, ARCHITECTURE AND DESIGN (3).** Legal aspects of engineering and design; an introduction to the American legal system with emphasis on problems of the engineering and design professions.

English (EH)

Professors Allen, Hitchcock, *Head*, Jacobson, Jones, Littleton, Morrow, Rygiel, Solomon, and T. Wright
 Associate Professors Brittin, Gresham, Hammersmith, Hudson, Koudis, Latimer, and Rose
 Assistant Professors Brown, Clark, Daron, Driggers, Dunlop, Nichols, Pitts, Roche, Rothschild, St. John, Smith, and Thompson
 Instructors Belins, Dixon, Eakin, Estermann, Farris, Gaeta, Glaze, Lackey, Moyle, Myrick, Neilson, Nunnally, Pitz, Rinaman, Sheppard, Sherman, Sloan, Toland, Vaughn, Vernon, Waters, Watson, Werner, Worsham, and R. Wright

The requirements for English and Comparative Literature majors enrolled in the School of Arts and Sciences are stated on page 83; requirements for English and Comparative Literature majors enrolled in the School of Education are stated on page 118.

English Composition (101-102-103 or 105-106) is required of all students and is a prerequisite for all other courses in English.

Most 300 through 600-level five-hour EH courses are offered in alternate years rather than annually. An exact schedule of course offerings is available in the English Department office.

I. GENERAL CURRICULUM COURSES

100. **BASIC ENGLISH (NO CREDIT).** All quarters. English grammar and mechanics and fundamentals of composition. Recommended for students with poor composition backgrounds or for students whose ACT or SAT verbal scores are low.
- 101-102-103. **ENGLISH COMPOSITION (3-3-3).** EH 101 pr. for 102; 102 pr. for 103. All quarters. The essentials of composition and rhetoric. Reading of selected essays, fiction, poems, and plays.
- 105-106. **HONORS ENGLISH (3-3).** EH 105 pr. for 106. EH 105, Summer, Fall; 106, Fall, Winter. Reading and composition for superior students. Students earning a C or better final grade in both courses will receive an additional three hours of credit. The student who fails to earn at least a C changes to the regular sequence (EH 101-102-103) and completes a total of three courses. Departmental approval required for admission to this sequence.
141. **MEDICAL VOCABULARY (3).** Fall, Winter, Spring. Prefixes, suffixes, and the more common root words of medical terminology.
- 250-251. **SURVEY OF ENGLISH LITERATURE FOR SUPERIOR STUDENTS (5-5).** EH 250 rec. before 251. English literature from *Beowulf* to the present. An optional alternative to EH 253-254-255 for students with a B or better average in Freshman English.
- 253-254-255. **SURVEY OF ENGLISH LITERATURE (3-3-3).** All quarters. EH 253 rec. before 254, 254 rec. before 255. English literature from *Beowulf* to the present.
- 260-261-262. **SURVEY OF LITERATURE OF THE WESTERN WORLD (3-3-3).** All quarters. Master works from Homer to Faulkner; EH 260, the classical period; EH 261, medieval through eighteenth century; EH 262, nineteenth and twentieth centuries.
- 270-271-272. **SURVEY OF AMERICAN LITERATURE (3-3-3).** All quarters. EH 270 rec. before 271; 271 rec. before 272. EH 270, beginnings to mid-nineteenth century; 271, later nineteenth and early twentieth centuries; 272, twentieth century.

II. ENGLISH LITERATURE

405. **CHAUCEER (5).** The major works of Chaucer in Middle English.
406. **MEDIEVAL ENGLISH LITERATURE (5).** This course concentrates on *Le Morte d'Arthur*, *Sir Gawain and the Green Knight*, *Pearl*, medieval drama, and the Middle English lyric.
450. **MODERN BRITISH LITERATURE (5).** British poetry and prose, 1910-1945.
452. **CONTEMPORARY BRITISH LITERATURE (5).** British poetry and prose, 1945-present.
454. **SEMINAR IN LITERARY TOPICS (5).*** Concentrated investigation of major figures in varying literary fields.
461. **ENGLISH DRAMA, BEGINNINGS TO 1642 (5).**
462. **POETRY AND PROSE OF THE ENGLISH RENAISSANCE, 1475-1603 (5).**
463. **RESTORATION AND NEO-CLASSICAL LITERATURE, 1660-1745 (5).**
464. **THE AGE OF JOHNSON, 1745-1798 (5).** Poetry, prose, and drama.
465. **MILTON (5).**
466. **POETRY AND PROSE OF THE SEVENTEENTH CENTURY (5).** Non-dramatic British literature, 1603-1660.

475. **THE ENGLISH ROMANTICS (5).** Poetry and prose from Wordsworth through Keats.
479. **HONORS THESIS (3).*** For Honors Program students. Repeatable once.
- 498-499. **READINGS FOR HONORS (5-5).*** Pr., junior standing with a minimum of 3.0 overall average, a 3.5 average in at least five upper division English courses, and the consent of the English Department. Individual reading programs in a specific period or phase of literature or language, as determined by the instructor and student. An honors essay and a written examination will be required.
525. **SPECIAL TOPICS SEMINAR (3-5).***
551. **EARLY SHAKESPEARE (5).** The Comedies, Histories, and Early Tragedies. Credit for this course precludes credit for EH 350.
552. **LATER SHAKESPEARE (5).** Tragedies, Dark Comedies, and Romances. Credit for this course precludes credit for EH 350.
557. **VICTORIAN LITERATURE (5).** The major poets and nonfiction writers from 1830 to 1890.
581. **EIGHTEENTH-CENTURY ENGLISH NOVEL (5).**
582. **NINETEENTH-CENTURY ENGLISH NOVEL (5).**

III. AMERICAN LITERATURE

325. **THE SHORT STORY (5).** The development of the short story in America and Europe from the early nineteenth century to the present.
356. **EARLY AMERICAN LITERATURE (5).** American literature to 1800.
357. **AMERICAN ROMANTICISM (5).** Nineteenth-century American literature, to approximately 1865.
358. **AMERICAN REALISM AND NATURALISM (5).** American literature of the later nineteenth and early twentieth centuries.
359. **MODERN AMERICAN LITERATURE (5).** American poetry and prose, 1914-1945.
360. **CONTEMPORARY AMERICAN LITERATURE (5).** American poetry and prose, 1945-present.
472. **THE AMERICAN NOVEL (5).** The development of the American novel from the beginning to 1900.
591. **AMERICAN POETRY (5).** Major American poets from the colonial period to the present.
592. **AMERICAN DRAMA (5).** American dramatic and stage history from colonial times to the twentieth century, with emphasis on developing tastes and techniques.
595. **SOUTHERN LITERATURE (5).** The poetry, fiction, and nonfiction prose writings in the South from Revolutionary times to the present, with major emphasis centering on Southern regional attitudes and trends. Credit for this course precludes credit for EH 365.

IV. LITERATURE IN TRANSLATION

312. **THE EUROPEAN NOVEL (5).** The reading and analysis of significant novels by major European writers.
335. **CLASSICAL MYTHOLOGY (3).** The character and influence of Greek and Roman mythology.
340. **THE CLASSICAL BACKGROUND (5).** Readings from the major Greek and Roman writers. The texts studied are chosen with particular attention to their subsequent influence upon English and American literature.
353. **CONTEMPORARY DRAMA (5).** Continental, British, and American dramatists from Ibsen to the present.
571. **RENAISSANCE AND BAROQUE (5).** A survey of the major trends in European literature from the fourteenth to the seventeenth centuries.
573. **EUROPEAN ROMANTICISM (5).** A comparative study of the major authors of the Romantic movement in Europe. The course's aim will be to distinguish national peculiarities and determine possibilities of a common thematic, stylistic ground.
574. **REALISM TO NATURALISM (5).** A comparative study of major French, German, and Russian authors of Realism and Naturalism with a view to evolving novelistic techniques, subject matter, and philosophy.
575. **THE SYMBOLIST MOVEMENT IN LITERATURE (5).** A comparative study of Symbolism of the late nineteenth and early twentieth centuries.

V. LANGUAGE AND LINGUISTICS

391. **CONTEMPORARY RHETORIC (5).** The principles of rhetorical analysis and of modern stylistics with practical application of those principles to varied types of literary materials.
393. **INTRODUCTION TO LINGUISTICS (5).** A broad survey of the system and structure of modern American English (sounds, words, syntax, meaning) as well as developments in special areas of English linguistics, including the neurology and psychology of language, animal communication, and regional and social dialectology.
541. **HISTORY OF THE ENGLISH LANGUAGE (5).** The chronological development of the English language.

594. **MODERN ENGLISH GRAMMARS (5).** Modern methods of language study, with particular emphasis on English syntax and semantics.

VI. WRITING COURSES

301. **INTRODUCTORY FICTION WRITING (3).**
302. **ADVANCED FICTION WRITING (3).** Pr., EH 301.
303. **INTRODUCTORY POETRY WRITING (3).**
304. **ADVANCED POETRY WRITING (3).** Pr., EH 303.
390. **ADVANCED COMPOSITION (5).** All quarters. The practice and theory of expository writing; the command of language for the clear and forceful communication of ideas.
530. **THE CRAFT OF FICTION (5).** Pr., EH 301-302, COI. The writing of fiction.

VII. COURSES ON SPECIAL TOPICS

310. **WORD STUDY (3).** A general, broad-based exploration of the lexical component of the English language.
350. **SHAKESPEARE'S GREATEST PLAYS (3).** Some of Shakespeare's masterpieces. Credit for EH 551-552 precludes credit for this course.
365. **SOUTHERN LITERATURE (3).**
373. **SCIENCE FICTION (3).** Representative science fiction from the nineteenth century to the present.
374. **THE GOTHIC NOVEL (3).**
382. **POPULAR LITERATURE (3).** A study of various types of formula literature such as the detective story and the Western, and of the techniques of popular fictional writing.
383. **WOMEN IN ENGLISH AND AMERICAN LITERATURE (3).** Alternately, this course studies the stereotypes of women in literature and the achievement of women writers.
384. **THE AMERICAN DREAM (3).** The concept and sources of the American Dream and its influence on American literature from the discovery of America to the present.
385. **RECENT FICTION (3).** The reading and discussion of selected examples of the New Fiction.
386. **CONTEMPORARY PROSE (3).** Recent nonfiction prose works noteworthy for their style and content.
387. **MEDICINE IN LITERATURE (3).** Works of literature dealing with medicine and medical professionals, with focus on the twentieth century.
388. **AMERICAN HUMOR (3).** Humor in American literature, with particular investigation of its national characteristics.
401. **INTRODUCTION TO LITERARY ANALYSIS (3).** Pr., one English course in literature at the sophomore level or above. Fundamental terminology and strategies for the analysis of all aspects of literature; reading and writing.
402. **STRUCTURES OF LITERATURE (3).** Pr., EH 401. The analysis of literature and the writing of analytical prose; emphasis on specific structures of different kinds of literary art.

GRADUATE

601. **INTRODUCTION TO THE TEACHING OF FRESHMAN ENGLISH (3).**
604. **ENGLISH COMPOSITION: APPROACHES AND ISSUES (5).**
614. **THE THEORY OF PROSE FICTION (5).** Methods and techniques of prose fiction, particularly as they developed during the late nineteenth and early twentieth centuries. The course will focus on the close study of selected novels and criticism.
620. **OLD ENGLISH (5).**
621. **MIDDLE ENGLISH (5).**
623. **BEOWULF (5).** Pr., EH 620.
625. **MEDIEVAL LITERATURE (5).**
626. **CHAUCEER (5).**
627. **THE STRUCTURE OF ENGLISH (5).**
628. **STUDIES IN LINGUISTICS (5).** Pr., EH 393, 627, or an equiv. course
629. **STYLISTICS (5).**
631. **ELIZABETHAN AND JACOBAN DRAMA (5).**
632. **SPENSER (5).**
633. **STUDIES IN THE POETRY AND PROSE OF THE ENGLISH RENAISSANCE (5).**
634. **POETRY AND PROSE OF THE SEVENTEENTH CENTURY (5).**

- 635. STUDIES IN SHAKESPEARE (5).
- 636. MILTON (5).
- 640. RESTORATION AND EIGHTEENTH-CENTURY ENGLISH DRAMA (5).
- 641. STUDIES IN THE AGE OF POPE (5).
- 642. STUDIES IN THE AGE OF JOHNSON (5).
- 650. STUDIES IN ENGLISH ROMANTICISM (5).
- 652. VICTORIAN POETRY (5).
- 653. VICTORIAN PROSE (5).
- 654. STUDIES IN THE NINETEENTH-CENTURY ENGLISH NOVEL (5).
- 660. MODERN POETRY (5).
- 681. MODERN FICTION (5).
- 682. STUDIES IN TWENTIETH-CENTURY LITERATURE (5).
- 683. STUDIES IN MODERN DRAMA (5).
- 670. AMERICAN LITERATURE OF THE COLONIAL AND REVOLUTIONARY PERIODS (5).
- 671. STUDIES IN AMERICAN LITERATURE, 1800-1860 (5).
- 672. STUDIES IN AMERICAN LITERATURE, 1860-1914 (5).
- 673. STUDIES IN THE LITERATURE OF THE SOUTH (5).
- 680. THE HISTORY OF LITERARY CRITICISM (5).
- 681. THE HISTORY OF LITERARY CRITICISM (5). Continuation of EH 680
- 684. DIRECTED INDIVIDUAL STUDY (Variable credit). (May be repeated up to 10 hrs. of credit.)
- 699. RESEARCH AND THESIS.
- 799. RESEARCH AND DISSERTATION.

ENGLISH — APPLIED WRITING (EHA)

- 304. TECHNICAL WRITING (3). All quarters. Practical writing, especially correspondence and reports, for students in scientific and technical fields. Credit for EH 315 precludes credit for this course.
- 307. CRIMINAL JUSTICE REPORT WRITING (3). Fall, Spring. Report and correspondence writing for students in criminal justice fields.
- 315. BUSINESS AND PROFESSIONAL REPORT WRITING (3). All quarters. The writing of formal and informal business reports with emphasis on design, organization, research, and presentation.
- 415. WRITTEN BUSINESS COMMUNICATIONS (3). Pr., EHA 315, for curricula requiring EHA 315 and 415. All quarters. Application of semantics, communication theory, human relations, and rhetorical techniques to written business communications; practice in expository and persuasive writing.
- 416. APPLIED WRITING AND EDITING (3). Winter. An advanced course designed to develop skills in writing and editing documents common in business and industry; emphasis on preparing house organs, proposals, brochures, position papers, and annual reports.

Environmental Science (EHS)

For information on this program refer to the description of the curriculum in the Inter-departmental curricula section of the Bulletin.

Family and Child Development (FCD)

Professor Purcell

Associate Professors Bradbard, Head, Layfield, and Lindholm
 Assistant Professors Britt, Griffin, Hannan, Mize, Smith, and Storm
 Instructors Coker, Grover, Johnson, and Watkins

- 157. FAMILY AND HUMAN DEVELOPMENT (3). Human development as it is affected by the family and the family as it affects and is affected by the culture. Prior credit for any other Family and Child Development course precludes credit for this course for majors only.
- 267. HUMAN DEVELOPMENT I: PRINCIPLES & THEORIES (4). Introduction to the principles and theories of human development.
- 269. FAMILY I: MATE SELECTION AND MARITAL INTERACTION (4). Analysis of courtship, mate selection, and marital interaction. Factors contributing to marital stability and success.

270. **FAMILY II: STRUCTURE AND FUNCTION OF THE FAMILY (4).** Introduction to the structure and function of the family, its interaction with other societal institutions, and the effects on all family members.
280. **HUMAN DEVELOPMENT II: INFANCY (4).** Pr., FCD 267 or COI. Winter. Intensive study of physical, cognitive, and psycho-social aspects of development from conception to age two. Lab. experiences may be arranged.
287. **CAREERS IN FAMILY AND CHILD DEVELOPMENT (2).** Introduces students to the range of career choices in the field of family and child development and the preparation needed to qualify for them. Includes orientation to the Department.
300. **APPROACHES TO CHILD STUDY (4).** LEC. 3, LAB. 2. Pr., FCD 267, 270. Principles and techniques of studying children and their families. Directed observation experiences are arranged in the Child Study Center.
301. **HUMAN DEVELOPMENT III: EARLY AND MIDDLE CHILDHOOD DEVELOPMENT (5).** LEC. 4, LAB. 2. Pr., FCD 267 or 270. Physical, intellectual, social, and emotional development of children from early through middle childhood; familial influences on development and behavior. Laboratory experiences are required.
302. **HUMAN DEVELOPMENT IV: ADOLESCENCE AND EARLY ADULTHOOD (4).** Pr., FCD 267, 270, and junior standing. A study of the individual from adolescence through early adulthood, emphasizing familial influence on development and behavior. Field assignments are required.
306. **FAMILY III: PATTERNS OF FAMILY INTERACTION (4).** Pr., FCD 270. Current theories of family interaction including normal and deviant patterns and other effects.
309. **INTRODUCTION TO MARRIAGE AND FAMILY THERAPY (4).** Pr., FCD 270 or COI. A broad overview of the history, theory and application of marriage and family therapy.
310. **TECHNIQUES OF CHILD AND FAMILY INTERVIEWING (4).** Pr., COI. Principles and techniques of interviewing and establishing a helping relationship with children and families.
330. **LIFESPAN HUMAN DEVELOPMENT (5).** Pr., FCD 157, or 270 or PG 211 or SY 301 or COI. A survey of the basic theories and empirical data related to the process of human development from conception to death, with focus on practical implications. Laboratory experiences required. This course is designed primarily for Nursing and Vocational Home Economics students. Not open to FCD majors.
347. **LABORATORY EXPERIENCES WITH YOUNG CHILDREN (3).** LEC. 1, LAB. 6. Pr., FCD 267, 270, 300, 301. Substantive lecture material and supervised participation in the Child Study Center preschool programs. (Required of all FCD majors.)
350. **DAY CARE FOR CHILDREN (4).** Pr., FCD 267, 301, junior standing, or COI. An historical and theoretical study of day care with discussion of multi-cultural programs, licensing standards, and various patterns of group and family day care service. Field assignment required.
358. **LEARNING EXPERIENCES FOR YOUNG CHILDREN (6).** LEC. 4, LAB. 6. Pr., FCD 300, 301, 347, or COI. Theoretical foundations and practical applications of programs and activities for young children.
399. **EXPERIENTIAL LEARNING (1-6).** TBA. COI. Independent work experience arranged. A. Project Uplift; B. Child Study Center; C. Other approved placements. May be taken more than once. Total credit not to exceed 6 hours.
409. **UNDERGRADUATE RESEARCH AND STUDY. (CREDIT TO BE ARRANGED.) (1-5).** May be repeated for a maximum of 5 credits. Pr., departmental approval of written application. All quarters. Consent for enrollment is based on a written proposal outlining the proposed course of study. Students should consult the department head for further information and approval forms.
410. **DIRECTED READING IN FAMILY AND CHILD DEVELOPMENT. (CREDIT TO BE ARRANGED.) (1-3).** Pr., COI. May be repeated for a maximum of 3 credits.
420. **RECENT RESEARCH IN CHILD DEVELOPMENT (4).** Pr., FCD 267, 270. Synthesis of recent research in child development with particular emphasis on studies dealing with family influences on children.
438. **STUDY/TRAVEL IN FAMILY AND CHILD DEVELOPMENT (2-8).** Pr., junior standing and COI. Course may be repeated for a maximum of 12 undergraduate credit. Concentrated study of family and child development in foreign locations aimed at greater understanding of the dynamics of child development and patterns of family life. Lectures presented at prearranged points. Papers required on selected phases of the course.
467. **PARENT EDUCATION (4).** Pr., FCD 270. The principles of working with parents on both an individual and group basis. Laboratory experiences may be arranged.
477. **HUMAN DEVELOPMENT V: FAMILY AND AGING (3).** Pr., FCD 270. The interactive nature of the aging process as it relates to the family and its older members with emphasis upon the problems of health, finances, housing, and leisure time. Laboratory experiences provided.
497. **DIRECTED FIELD EXPERIENCE (5-15 HOURS IN A, B, C, D, E, OR F).** Pr., 487. No more than three (3) options may be taken for a total of twenty (20) credits. A. Social Services; B. Family and Child Development; C. Maternal and Child Health; D. Day Care; E. Parent Education; F. Aged. Field experience arranged on individual basis, supervised by faculty in community agencies, hospitals, clinics. Child Study and Family Life Centers.
499. **SEMINAR (2).** Pr., FCD 497 or COI.

ADVANCED UNDERGRADUATE AND GRADUATE

547. **ADMINISTRATION OF PROGRAMS FOR YOUNG CHILDREN (3).** Pr., FCD 358 or COI, senior standing. Essential procedures in programming for young children, including housing, equipment, financing, staff, records, feeding, health protection, and community relations. Field trips are arranged to selected children's centers.

568. **WOMEN'S CHANGING ROLES AND POTENTIALITIES (3).** A critical analysis of women's changing roles in society. Effects of these changes on the family and on women's self-fulfillment and social contributions.

GRADUATE

609. **SPECIAL PROBLEMS (1-5).** Pr., COI, and approval of written application by major professor. May be taken for more than one quarter. Not to exceed 5 hours of credit toward the minimum of 48 for the M.S. degree. All quarters. A. Family Relations; B. Child Development; C. Marriage and Family Therapy; D. Parent Education.
810. **THEORIES OF HUMAN DEVELOPMENT (4).** Pr., FCD 267 or equivalent. Cognitive, personal, and social development from birth through maturity and old age, with special attention to the influence of the family on the individual.
811. **ADVANCED CHILD DEVELOPMENT (4).** Pr., FCD 610 or PG 533 or COI. Advanced study of theoretical and empirical material regarding child development from conception through adolescence, with emphasis on physical and cognitive development.
816. **SOCIAL DEVELOPMENT OF CHILDREN (4).** Pr., FCD 611 or COI. Theory and research related to the acquisition of social behavior by children.
818. **DAY CARE AND THE FAMILY: RESEARCH AND ISSUES (4).** Pr., FCD 611 or COI. Research and issues concerning the impact of day care on the family unit and children's social, emotional, and cognitive development.
820. **MARITAL AND FAMILY SYSTEMS (5). LEC. 4, LAB. 1.** Pr., SY 301, FCD 270 or 610, or COI. Intensive study and application of the systems approach to the understanding of family interaction and family problems.
821. **PARENT-CHILD INTERACTION (4).** Pr., FCD 270, 610 or COI. Discussion of parent-child interactions and evaluation of relevant research literature.
822. **DYSFUNCTIONS IN MARRIAGE AND FAMILY (4).** Pr., FCD 620. The dynamics and assessment of common dysfunctions in marital and family relationships based on current theory and research.
823. **RESEARCH METHODS FOR CHILD AND FAMILY STUDY (4).** Pr., FCD 610 or COI. Survey of principles and methods for the study of children and their families.
824. **MARRIAGE AND FAMILY THERAPY (4).** Pr., FCD 610, 620, and 622 or CED 628 or PG 638 or COI. Overview of the major marriage and family therapy approaches.
825. **HUMAN SEXUAL BEHAVIOR (4).** Pr., FCD 610 and 620; Pr., or coreq., FCD 622. Nature of sexual development, normal and abnormal sexual functioning; attitudes toward sex. Treatment of sexual dysfunction.
828. **PARENTAL EDUCATION (4).** Pr., SC 273, FCD 610, 611, and 620 or COI. Parent education, its scope, aims, and effects on parent-child relationships.
829. **READINGS IN FAMILY LIFE AND CHILD DEVELOPMENT (4).** Pr., FCD 267, 270 or COI. Current literature and research concerning the pre-school child; the school-age child; the adolescent; the young adult; problems of later maturity; changing family patterns.
830. **ASSESSMENT IN MARITAL AND FAMILY THERAPY (4).** Pr., FCD 623, FED 672 or 673, or COI. An indepth study of current marital and family assessment techniques with emphasis on administration and interpretation.
837. **PROFESSIONAL ISSUES IN FAMILY AND CHILD DEVELOPMENT (2).** Pr., FCD 625. History of professionalization. Role and function of professional associations and organizations, with professional licensure, ethics, and issues of private practice discussed.
840. **MARRIAGE AND FAMILY THERAPY PREPRACTICUM (4).** Pr., FCD 620 or COI. A. Strategic, B. Structural, C. Behavioral, D. Intergenerational, E. Other. Study and clinical practice, under intensive supervision of major approaches to family therapy. Must be taken at least twice, representing two different approaches.
860. **SEMINAR (1-5).** A. Family Relations; B. Child Development; C. Research Techniques; D. Marriage and Family Therapy; E. Parent Education.
862. **PRACTICUM (2-16).** All sections except E may be repeated for a maximum of 8 hours credit. Pr., Departmental approval. A. Child Development; B. Family Relations; C. Parent Education; D. Day Care and Programs for Young Children.
864. **MARRIAGE AND FAMILY THERAPY PRACTICUM (2-16).** May be repeated for a maximum of 16 hours credit. Pr., departmental approval. A. Group supervision; B. Individual Supervision.
899. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** Required of all students under the Thesis Option in any field.

Fisheries and Allied Aquacultures (FAA)

Professors Shell, *Head*, Boyd, Davies, Grover, Lovell, Moss,
Rogers, Schmittou, and Smitherman

Associate Professors Bayne, Duncan, Grizzle, Lovshin, Plumb, and Ramsey
Assistant Professor Malvestuto

201. **COMMERCIAL MARINE FISHERIES OF ALABAMA (3).** Exploitation and biology of commercial vertebrates and invertebrates of Alabama and the adjoining Gulf of Mexico, with emphasis on distribution, harvesting technology, processing, and economic values. Laboratory exercises include visits to local processing plants, and a trawling expedition. Taught only at Dauphin Island Sea Lab.

312. **PRACTICAL FISH CULTURE (5). AS ARRANGED.** Credit will be arranged for 3 months in a state or federal hatchery or in an approved commercial hatchery or on other phases of fish culture. All students wishing to take this course must obtain permission to do so from the Head of the Department.
315. **FISHERIES AND ALLIED AQUACULTURES INTERNSHIP (1-5).** S-U graded. Discipline-related learning while employed with cooperating private industry and state and federal agencies.
393. **UNDERGRADUATE SEMINAR (1).** Fall. Consideration of various aspects of fisheries work, career options as related to individual interests and curriculum planning.
498. **SPECIAL PROBLEMS IN FISHERIES AND AQUACULTURES (1-5).** Pr., senior standing. A student can register for a total of not more than three hours credit.

ADVANCED UNDERGRADUATE AND GRADUATE

505. **CATFISH PRODUCTION (5).** Summer, even years. Pr., BI 103 or COI. Principles and practices of farm commercial catfish production. Offered as week-long short course at Auburn with preparatory reading and additional day field trip.
510. **ORGANIZATION, PROGRAMMING AND IMPLEMENTATION OF AQUACULTURAL EXTENSION (5).** LEC. 3, LAB. 6. Pr., AEC 202 or equivalent. Spring. Concepts and practices pertaining to aquacultural extension organization, administration, program development and implementation in the U.S. and developing countries.
511. **INTRODUCTION TO AQUACULTURE (5).** LEC. 5. Pr., BI 103 and junior standing. Winter. Principles underlying aquatic productivity and levels of management as demonstrated by present practices of fish culture around the world.
515. **LIMNOLOGY (5).** LEC. 3, LAB. 6. Pr., CH 104, PS 205, BI 103. Spring. Biological, chemical and physical factors affecting aquatic life.
516. **WATER QUALITY MANAGEMENT IN AQUACULTURE (5).** LEC. 5. Fall. Pr., CH 208 or COI and junior standing. Principles of water quality and techniques for its management in fisheries and aquaculture.
518. **FISH GENETICS AND BREEDING (3).** LEC. 3. Fall. Pr., ZY 300 and junior standing. Philosophy of breeding in fishes and other aquatic animals; principles and methods in fish breeding; inheritance of characters responsible for efficient fish production.
519. **AQUACULTURE (9).** Pr., ZY 501, FAA 538 or ZY 538. Summer. A review of the technology, principles, and problems relating to the science of aquaculture with emphasis on the culture of marine species. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
520. **AQUACULTURAL PRODUCTION I (5).** LEC. 3, LAB. 8. Pr., BI 103. Study of farm organization and operation. Development of skills and attitudes of applied, practical aquaculture emphasizing facility organization and scheduling, equipment use, establishing fish pond populations and crop management in ponds and other culture facilities.
521. **AQUACULTURAL PRODUCTION II (5).** LEC. 3, LAB. 8. Pr., BI 103. Application and practice of aquacultural technology and management emphasizing fish health, nutrition, hatchery operations, water quality and general environmental management.
522. **AQUACULTURAL PRODUCTION III (5).** LEC. 3, LAB. 8. Pr., BI 103. Advanced field application of aquacultural practices emphasizing fish inventory, harvesting and transporting, pest management and aquacultural practices assessment.
528. **HATCHERY MANAGEMENT I (5).** LEC. 3, LAB. 6. Pr., BI 103. Operation of hatcheries; spawning and hatching methods for warm-water fishes. Emphasis on induced breeding.
529. **HATCHERY MANAGEMENT II (5).** LEC. 3, LAB. 6. Pr., BI 103 and FAA 528. Operation of nursery facilities for producing seed stock of warm-water fishes. Emphasis on pond management to optimize yield of fingerlings.
530. **POND CONSTRUCTION (5).** LEC. 1, LAB. 8. Fall. Principles and practice of site selection, design and construction of aquacultural facilities with emphasis on ponds.
535. **MANAGEMENT OF AQUATIC FLORA IN FISHERIES AND AQUACULTURE (5).** LEC 3, LAB. 6. Pr., or Coreq., BY 506 or equivalent and COI. Summer. The role of aquatic vegetation in fish production, its utilization and control.
536. **MANAGEMENT OF SMALL IMPOUNDMENTS (5).** LEC. 3, LAB. 6. Pr., BI 103. Summer. Consideration of the species of fish used in management of small impoundments, species balance, population balance analysis, methods of correcting unbalanced conditions, renovation of old impoundments, and related problems of water management.
537. **FISHERIES BIOLOGY (3).** Pr., BI 103. Winter. An introduction to the study of vital statistics of fish populations.
538. **GENERAL ICHTHYOLOGY (5).** LEC. 3, LAB. 6. Pr., BI 103. Fall. Survey of functional morphology, classification and distribution of fishes. Introduction to faunistic literature of North America and the world. Identification of fishes from the Gulf of Mexico and North American fresh waters.
539. **FISHERIES BIOLOGY LABORATORY (2).** LAB. 6. Pr., FAA 537 or COI. Winter. Laboratory exercises in sampling (bias, precision, accuracy), population estimation, age and growth, mortality and population dynamics models.
542. **MARINE FISHERIES MANAGEMENT (6).** Pr., COI. Summer. An overview of practical marine fishery management problems. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
545. **FISH PARASITOLOGY (3).** LEC. 3. Pr., BI 103. Fall. Basic concepts of fish parasitology and epizootiology. Identification and control of fish parasites.
- 545L. **FISH PARASITOLOGY LABORATORY (2).** LAB. 6. Pr., BI 103. Fall. Laboratory and field exercises emphasizing the collection, preparation and identification of fish parasites.

546. **MICROBIAL FISH DISEASES (5).** LEC. 3, LAB. 6. Pr., BY 300. Spring. Bacterial and viral diseases of fishes, their isolation, culture, identification, and control.
548. **SAMPLING FISH POPULATIONS (1).** LAB. 4. Pr., FAA 537 or COI. Spring. Theory, equipment, and procedures for sampling fish populations.
550. **EARLY LIFE HISTORY OF MARINE FISHES (6).** Pr., ZY 306, FAA 538 or ZY 538, and/or COI. Summer. Reproductive strategies and early developmental processes of marine fishes. Includes discussion of temporal and spatial distribution patterns, population dynamics, and ecological interactions of fish eggs and larvae; role of early stages of fishes in fisheries oceanography, marine ecology, and systematics; methods of sampling and identifying fish eggs and larvae; data quantification and analysis; rearing experiments; techniques for studying larval fish dynamics. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
599. **RESEARCH METHODS (3).** LEC. 3. Pr., COI. Winter. Lectures on principles of biological research in fisheries and aquaculture, planning, administration and evaluation of research projects, technical writing and professionalism.

GRADUATE

615. **FISHERY ASSESSMENT AND MGT. (3).** LEC. 3. Pr., FAA 539. Summer. Gear selectivity and sampling designs. Interpretation of quantitative data on fish populations. Application of yield models to assessment and management of fish stocks.
616. **SYSTEMATIC ICHTHYOLOGY (3).** LEC. 1, LAB. 6. Pr., ZY 538, FAA 538 or COI. Winter odd years. Fishes of the world: their morphology, distribution and use to man. The course emphasizes individual work with world faunistic literature, revisions and museum materials.
617. **QUANTITATIVE TECHNIQUES IN FISHERIES BIOLOGY (3).** LAB. 6. Pr., FAA 539, BY 216 or equivalent or COI. Summer. Analysis of fisheries data using the computer. Application of the Statistical Analysis System (SAS) will be stressed.
619. **CRUSTACEAN AND MOLLUSCAN AQUACULTURE (3).** LEC. 3. Fall. Pr., FAA 511 or COI. General biology and culture techniques of the major shrimp, crawfish and shellfish species cultured throughout the world.
620. **FISH PROCESSING TECHNOLOGY (5).** LEC. 3, LAB. 6. Pr., CH 208 and BY 300 or ADS 514. Winter. Chemical and biological aspects of fishery products as they are related to the use of these products for human foods; principles of preservation; unit operations in processing; packaging, storage, and distribution.
621. **FISH NUTRITION (5).** LEC. 3, LAB. 6. Pr., CH 208 and course in physiology or nutrition or COI. Summer. Fundamental and applied aspects of fish nutrition including the physiology of food assimilation, nutrient requirements, nutrient chemistry of feed sources, ration formulation and practical feeding.
622. **ADVANCED WATER QUALITY MANAGEMENT IN AQUACULTURE (5).** LEC. 3, LAB. 6. Winter. Pr., FAA 516. Advanced study of water quality as related to fisheries and aquaculture. Laboratory will feature measurements of relevant water quality variables.
626. **WATER UTILIZATION IN AQUACULTURE (5).** LEC. 5. Pr., FAA 516. Winter. Climatic, geologic, hydrologic, economic and hydraulic factors influencing the utilization of water for aquaculture.
644. **MORPHOLOGY & PHYSIOLOGY OF FISH (5).** LEC. 3, LAB. 6. Winter. Pr., FAA 538 or COI. Advanced studies of fish morphology and physiology. Emphasis: on teleosts and topics of importance to students in fishery biology, aquaculture, and fish health.
645. **ADVANCED FISH PARASITOLOGY (3).** LEC. 1, LAB. 6. Pr., FAA 545. Winter. The morphology, taxonomy, life history, ecology and pathological effects of parasites of fish.
646. **ADVANCED MICROBIAL FISH DISEASES (3).** LEC. 1, LAB. 6. Pr., FAA 546 or COI. Fall. Advanced study of the epizootiology, pathogenesis, isolation, taxonomy and immunology of bacterial and viral diseases of fish.
647. **CLINICAL FISH DISEASE DIAGNOSIS (1-3).** Pr., 544, 545, 546 or COI. Any quarter by arrangement. Clinical diagnosis of fish diseases; necropsy of diseased fish and formulating corrective measures for diseased condition. May be repeated for a maximum of 6 hours credit.
649. **FISH PATHOLOGY (3).** LEC. 2, LAB. 3. Pr., FAA 544, 545, 546. Summer. Structural and functional changes produced by fish diseases.
666. **FISH HEALTH MANAGEMENT (3).** Summer, odd years. Graduate standing, fisheries or animal health background, or COI. A lecture course covering epizootiology of fish diseases, host response to stress, disease process and treatment and control of diseases by management of environment or chemotherapeutics.
693. **SEMINAR (1).** LEC. 1. Fall, Winter.
696. **SPECIAL PROBLEMS IN FISHERIES AND ALLIED AQUACULTURES (2-5).** A. Aquaculture; B. Aquatic Ecology; C. Biology and Management; D. Ichthyology; E. Nutrition; F. Pathology; G. Processing and Technology; H. Water Quality; I. Technology Transfer; J. Computer Applications; K. Aquacultural Facilities.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
799. **DOCTORAL RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Food Science (FS)

Professors Davis, Huffman, Lane, Lovell, McCaskey, and Rymal
 Associate Professors M. F. Chastain, *Chairman*, Flood, Jones, and Smith
 Assistant Professor G. Trout
 Instructors Brown and Strawn
 Extension Specialist Zenoble

The Food Science curriculum is administered by the Department of Nutrition & Foods.

201. **INTRODUCTORY FOOD SCIENCE (3).** LEC. 2, LAB. 2. Principles of major food processing methods, concepts of food quality, nutrition, sanitation, safety of food additives and food laws. Overview of careers in food science and food technology. (Same course as NF 201.)
260. **GROWTH AND BODY COMPOSITION (4).** LEC. 2, LAB. 4. Winter, Spring. Prenatal and postnatal growth of muscle, fat, and bone of meat animals; the evaluation of body composition, quality, and yield grading; the pricing of live animals and their carcasses. (Same course as ADS 260.)
331. **MEAT SELECTION AND GRADING (3).** LEC. 1, LAB. 4. Spring. The development of grading standards and application of federal grades to lamb, pork and beef carcasses, comparative evaluation of carcasses and wholesale cuts. Some labs in nearby processing plants. (Same course as ADS 331.)
340. **INDUSTRIAL FOOD PRESERVATION TECHNOLOGY (5).** LEC. 3, LAB. 4. Pr., COI or junior standing. Fall, odd years. Principles of food preservation as applied to industry. Processes considered including refrigeration, pasteurization, canning, freezing, drying, concentration, fermentation, pickling, salting, irradiation, and the use of food additives. (Same course as HF 340.)
355. **FOOD ENGINEERING (5).** Fall. Pr., MH 161, PS 205. Engineering concepts and unit operations used in processing and handling of food products. (Same course as AN 355.)
370. **MEAT SCIENCE (5).** LEC. 4, LAB. 3. Fall, Winter. Fundamentals of slaughter, processing, storage and merchandising of meat and meat products. Biochemical and physiological implications of nutrition, breeding and antemortem treatment on meat quality, curing and processing. (Same course as ADS 370.)
375. **FUNDAMENTALS OF DAIRY PROCESSING (5).** LEC. 3, LAB. 4. Winter. Physical and chemical characteristics of milk. Milk quality. Basic processing technology. (Same course as ADS 375.)
429. **FOOD SCIENCE SEMINAR (1).** Pr., senior standing. Winter. Lectures, demonstrations and literature reviews by staff, students, and guest lecturers. (Same course as HF 429.)
431. **ADVANCED MEAT JUDGING (3).** Pr., ADS 331. Fall. Practice in evaluation and grading of beef, pork and lamb carcasses and cuts. Development of communication skills for the meat industry and exposure to animal agriculture through training in local meat packing plants and intercollegiate competition. (Same course as ADS 431.)
543. **FOOD CHEMISTRY (5).** LEC. 3, LAB. 4. Pr., CH 207. Winter. The chemistry of the important components of foods and changes occurring during processing, storage and handling. (Same course as HF 543.)
545. **FOOD ANALYSIS AND QUALITY CONTROL (5).** LEC. 3, LAB. 4. Pr., HF 543. Spring. Sensory, chemical and instrumental food analysis and its application to quality control and evaluation of grades and standards. (Same course as HF 545.)
566. **FOOD MICROBIOLOGY (5).** LEC. 3, LAB. 4. Spring. Relationship of habitat to the occurrence of microorganisms on food; environment affecting the growth of various microorganisms in food; microbiological action in food spoilage and food manufacture; physical, chemical and biological destruction of microorganisms in foods; microbiological examination of foodstuffs; and public health and sanitation microbiology. (Same course as MB 566.)
570. **ADVANCED MEAT SCIENCE AND MUSCLE BIOLOGY (5).** LEC. 3, LAB. 4. Pr., ADS 370 or equivalent. Spring. Physiology and biochemistry of muscle and its conversion to meat; mechanism of muscle contraction; muscle microanatomy; antemortem and postmortem factors influencing fresh meat composition and quality. (Same course as ADS 570.)
575. **ADVANCED DAIRY PROCESSING (4).** LEC. 3, LAB. 3. Pr., ADS 375 or COI. Spring. Specialized techniques in the processing of different types of dairy products; automation in the dairy plant; quality assurance program. (Same course as ADS 575.)
577. **FOOD PLANT SANITATION (4).** LEC. 3, LAB. 2. Pr., BY 300 or COI. Sanitary regulation of food plants. Hazards in the food system and their elimination. Quality assurance.

Foreign Languages (FL)

Professors DiOrto, Henkels, and Madrigal

Associate Professors Helmke, *Acting Head*, Morris, Perricone,
Rivas, Spencer, and Warbington

Assistant Professors Escarpanter, Glaze, Latimer, Law, Millman, and Wolverton
Instructors Elmoro, Mitrevski, Spina, and Vandegrift
Language Laboratory Director Cox

It is to the student's advantage to begin foreign language at the highest possible level because by so doing he can gain college credits through advanced placement. On the basis of the Foreign Language Department's evaluation of his previous foreign language training and/or test scores, he may enter the second, third, or fourth quarter course in a language. If he makes a grade of C or higher, he will receive 10, 15, or 20 hours, respectively (5 credit hours for the course and 5, 10, and 15 hours, respectively, for advanced placement). If the student is well enough prepared, he may enter at a level higher than the fourth quarter, but he will not receive more than 15 hours through advanced placement.

If he does not earn at least a C, he will not be granted advanced placement credit. He may then enter the language at a lower level, re-enter at the same level, or attempt another approved language.

Credits earned through advanced placement may be applied toward graduation as well as toward foreign language requirements in various curricula.

While eligible for advanced placement as indicated above, students who are native speakers in a foreign language may begin courses in that language only at the 300-level or higher — excluding conversation courses altogether — if they have received substantial academic preparation in that same language (such as the French *Baccalauréat*, the German *Abitur*, the Spanish *Bachillerato*, or higher).

Students who are either foreign or U.S. ethnic native speakers in a foreign language, but with minimal or limited academic preparation therein, may begin courses in that language only at the 200-level or higher. If special situations arise, such as foreign language learning through extensive residence abroad, the adviser for the specific language involved will make an appropriate entry level determination, within the framework of these guidelines, upon request of the instructor in whose class the student is enrolled.

LANGUAGE PROFICIENCY, INTERNSHIPS, AND HONORS COURSES

- 080. PROFICIENCY IN ENGLISH FOR FOREIGN STUDENTS. (NO CREDIT.)** Individualized and small group instruction primarily for foreign graduate students who need to obtain greater proficiency in comprehension and in spoken and written English, including idiomatic expressions and cultural adaptation. May be repeated.
- 127-128. READING PROFICIENCY IN FRENCH. (NO CREDIT.)** LEC. 3. Pr., 127 for FL 128, departmental consent. Winter and Spring. Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 128 channels students into their field of study, e.g., humanities, social sciences, and sciences.
- 137-138. READING PROFICIENCY IN SPANISH. (NO CREDIT.)** LEC. 3. Pr., 137 for FL 138, departmental consent. Winter and Spring. Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 138 channels students into their fields of study, e.g., humanities, social sciences, and sciences.
- 157-158. READING PROFICIENCY IN GERMAN. (NO CREDIT.)** LEC. 3. Pr., 157 for FL 158, departmental consent. Winter and Spring. Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 158 channels students into their fields of study, e.g., humanities, social sciences, and sciences.
- 177-178. READING PROFICIENCY IN RUSSIAN. (NO CREDIT.)** LEC. 3. Pr. for FL 178, departmental consent. Winter and Spring. Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 178 channels students into their field of study, e.g., humanities, social sciences, and sciences.
- 180. PROFICIENCY IN ENGLISH FOR FOREIGN STUDENTS (1).** Individual and small group instruction primarily for foreign graduate students who need to obtain greater proficiency in comprehension and in spoken English, including idiomatic expressions and cultural adaptation. May be repeated for a maximum of 3 credits. Letter grade or S/U option.
- 391. LYRIC DICTION PROFICIENCY IN FRENCH, GERMAN, ITALIAN. (3).** Winter. Stress on phonetics and prosody. Primarily for undergraduate students in music seeking technical control of lyric diction and prosody in French, German, and Italian. May be used for foreign language students for elective credit only. This course does not substitute for the three quarters of foreign language required for the Bachelor of Music degree. May be repeated without credit.

471. **HONORS THESIS. (3-6).** A requirement for the honors student. Directed readings and research terminating in a thesis. May be repeated once for a maximum of six hours credit.
499. **FOREIGN LANGUAGE INTERNATIONAL TRADE INTERNSHIP (1-6).** Pr., junior standing and COI. Specific number of hours and applicability toward major to be determined in consultation with the adviser. May be repeated for a maximum of 6 credits.

LATIN

- 111-112-113. **FIRST YEAR LATIN I-II-III (5-5-5).** FL 111 pr. for 112; FL 112 pr. for FL 113. Fundamentals of Latin; language skills stressed with increasing emphasis on reading, including selections from ancient authors.
- 211-212-213. **SECOND YEAR LATIN I-II-III (5-5-5).** Pr., FL 113 or equivalent. FL 211 pr. for 212; FL 212 pr. for 213. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Review of Latin grammar and syntax and survey of Latin literature through selected readings of authors primarily from the Golden and Silver Ages, 80 B.C. — ca. 140 A.D.

FRENCH

- 121-122-123. **FIRST YEAR FRENCH I-II-III (5-5-5).** FL 121 pr. for 122; FL 122 pr. for 123. Fundamentals of French; language skills stressed with progressive emphasis on conversation. Exposure to French civilization.
220. **FRENCH PHONETICS AND PRONUNCIATION (1)** Pr., FL 122 or equivalent. Introduction to French phonetics and practice in basic French pronunciation patterns.
- 221-222-223. **SECOND YEAR FRENCH I-II-III (5-5-5).** Pr., FL 123 or equivalent. FL 221 pr. for 222; FL 222 pr. for 223. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Language skills stressed; structural review and composition; reading in French literature; exposure to French civilization.
228. **INTERMEDIATE FRENCH CONVERSATION (5*).** Pr., FL 123 or equivalent, or approval of French Adviser. Summer. Intensive practice in the spoken language with simultaneous review of vocabulary and structure. May be repeated once for credit. When combined with FL 229 can count toward the major or minor in lieu of FL 221.
229. **INTERMEDIATE FRENCH GRAMMAR AND COMPOSITION (5*).** Pr., FL 123 or equivalent or approval of French Adviser. Summer. Intensive review of French grammar, with emphasis on problem areas and written practice. May be repeated once for credit. When combined with 228 can count toward the major or minor in lieu of FL 221.
321. **FRENCH CONVERSATION (3 OR 5**).** Pr., FL 223 or equivalent. Fall. Practice in spoken, everyday French, based on texts and situations concerning contemporary life especially in France. May be repeated once for credit but counted only once toward a major.
322. **FRENCH COMPOSITION (3 OR 5**).** Pr., FL 223 or equivalent. Winter. Practice in writing letters, brief articles, themes and reports, based on original composition and on translation. May be repeated once for credit but counted only once toward a major.
323. **FRENCH CIVILIZATION (3).** Pr., FL 223 or equivalent. Spring. Consideration of topical aspects of the cultural heritage of France, as reflected in present day life patterns, traditions and institutions.
324. **FRENCH PHONETICS AND DICTION (3 OR 5**).** Pr., FL 223 or equivalent. Spring. Introduction to the basic principles of French phonetics and diction through sound recognition, discrimination, and intensive practice.
325. **SURVEY OF FRENCH LITERATURE I (3 OR 5**).** Pr., FL 223 or equivalent. Fall. Readings in French literature from the Middle Ages through the eighteenth century with particular emphasis on the seventeenth and eighteenth centuries.
326. **SURVEY OF FRENCH LITERATURE II (3 OR 5**).** Pr., FL 223 or equivalent. Winter. Readings in French literature from the nineteenth and twentieth centuries.
327. **SEMINAR IN FRENCH LITERATURE AND/OR LANGUAGE SKILLS (3 OR 5**).** Pr., FL 223 or equivalent. Summer. Readings in French literature from selected periods and/or practice in writing and speaking French. May be repeated once for credit but counted only once toward a major.
328. **FRENCH OR QUEBECOIS CIVILIZATION (5*).** Pr., FL 223 or equivalent. Summer. Consideration of selected aspects of French or Quebecois civilization in the light of historical cultural developments. To be offered only in the Auburn Abroad Program. Quebecois civilization will be treated when the Program is conducted in Montreal.
329. **BUSINESS FRENCH (3).** Pr., FL 223 or equivalent. Intensive practice in preparing commercial correspondence and reading contracts, agreements, and related documents in French. Emphasis will be placed on the acquisition of a business-oriented vocabulary.
427. **INDEPENDENT WORK IN FRENCH (3 OR 5**).** Pr., four 300-level French courses or equivalent. Directed study in area of special interest, for the superior student in French. May be repeated once for credit.

*This course is offered only in the Auburn Abroad Program.

**300; 500; and 600-level French and Spanish courses will carry five quarter hours of credit only when taken in the Auburn Abroad Program.

428. **FRENCH CONTINUING CONVERSATION (1).** Pr., FL 321 and FL 322, or equivalent. Continuing practice in spoken French to maintain and upgrade proficiency while completing other requirements for graduation. May not be counted toward a major, but may be repeated once for credit.
429. **FRENCH CONTINUING COMPOSITION (1).** Pr., FL 321 and FL 322, or equivalent. Continuing practice in written French to maintain and upgrade proficiency while completing other requirements for graduation. May not be counted toward a major, but may be repeated once for credit.

GERMAN

- 151-152-153. **FIRST YEAR GERMAN I-II-III (5-5-5).** FL 151 pr. to 152; 152 pr. to 153. Fundamentals of German. Stress on language skills, with pregressive emphasis on conversation. Exposure to Germanic civilization.
154. **INTENSIVE GERMAN LANGUAGE I (5*).** Summer. Introduction to German. Basic German grammar and conversation. This course may be substituted for FL 153.
- 251-252-253. **SECOND YEAR GERMAN I-II-III (5-5-5).** Pr., FL 153 or equivalent. FL 251 pr. to 252; 252 pr. to 253. Exceptions to the sequence may be granted by departmental consent or when course offerings so require. Stress on language skills; structural review and composition; readings in German literature and exposure to German civilization.
254. **INTERMEDIATE GERMAN (5*).** Pr., FL 153 or equivalent, or approval of German Adviser. Summer. Grammar, conversation, and reading. Intensive practice in German with simultaneous review of vocabulary and structure. This course does not substitute for FL 251, 252, or 253, but may count toward the major or minor in German.
256. **VIENNA: GROWTH OF AN URBAN CIVILIZATION (3*).** Pr., FL 252 and 253 or equivalent. Summer. An introduction to Viennese history and culture.
257. **AUSTRIAN CULTURE AND CIVILIZATION. (3*).** Pr., FL 252 and FL 253. Summer. Through discussion of slides and visits to historical and modern sites and Vienna, this course analyzes Austrian civilization and culture.
351. **GERMAN CONVERSATION (3).** Pr., FL 251 or equivalent. Fall. Practice in spoken, everyday German, based on texts and situations concerning contemporary life in Germany or other German-speaking countries. May be repeated once for credit but counted only once toward a major.
352. **GERMAN COMPOSITION (3).** Pr., FL 251 or equivalent. Winter. Practice in writing letters, brief articles, themes and reports based on original composition and translation. May be repeated once for credit but counted only once toward a major.
353. **GERMAN CIVILIZATION (3).** Pr., FL 251 or equivalent. Spring. Review of the cultural heritage of the German language, with emphasis on its present-day status, influence and civilization in Germany and abroad.
354. **SURVEY OF GERMAN LITERATURE I (3).** Pr., FL 253 or any two German courses on the 300-level. Fall. Readings in German literature of the earliest periods to the eighteenth century.
355. **SURVEY OF GERMAN LITERATURE II (3).** Pr. FL 253 or any two German courses on the 300-level. Winter. Readings in German literature of the nineteenth century.
356. **SURVEY OF GERMAN LITERATURE III (3).** Pr., FL 253 or any two German courses on the 300-level. Spring. Readings in German literature of the twentieth century.
357. **SEMINAR IN GERMAN LITERATURE (3).** Pr., FL 251 or equivalent. Summer. Readings in German literature from selected periods. Normally offered in Summer Quarter only.
359. **BUSINESS GERMAN (3).** Pr., FL 253 or equivalent. Intensive practice in preparing commercial correspondence and reading contracts, agreements, and related documents in German. Emphasis will be placed on the acquisition of a business-oriented vocabulary.
399. **EXPERIENTIAL LEARNING — GERMAN (3-6*).** Internship in Vienna.
450. **GERMAN FOR INTERNATIONAL TRADE (3).** Pr., FL 359 or equivalent. Practice in handling, preparing and translating international trade correspondence and documents in German. Development of case studies and other realistic international trade group work in German and English, under simulated real-life pressures.
451. **GERMAN CLASSICISM (3).** Pr., four 300-level German courses or equivalent. Alternate Fall. Consideration, analysis, and criticism of German writing of the classical period.
452. **GERMAN ROMANTICISM (3).** Pr., four 300-level German courses or equivalent. Alternate Winter. Consideration, analysis, and criticism of German Romantic writing.
453. **GERMAN REALISM AND NATURALISM (3).** Pr., four 300-level German courses or equivalent. Alternate Spring. Consideration, analysis, and criticism of German writing of Realism and Naturalism.
454. **GERMAN DRAMA (3).** Pr., four 300-level German courses or equivalent. Alternate Fall. Consideration, analysis, and criticism of selected German theater.

*This course is offered only in the Auburn Abroad Program.

455. **TWENTIETH-CENTURY GERMAN LITERATURE (3).** Pr., four 300-level German courses or equivalent. Consideration, analysis, and criticism of selected German prose prior to World War II.
456. **CONTEMPORARY GERMAN LITERATURE (3).** Pr., four 300-level German courses or equivalent. Consideration, analysis, and criticism of selected German writing since World War II.
457. **INDEPENDENT WORK IN GERMAN (3).** Pr., at least one 400-level German course and COI. Directed study in area of special interest for the superior student in German. May be repeated once for credit.
458. **GERMAN CONTINUING CONVERSATION (1).** Pr., four 300-level German courses, including FL 351 and FL 352, or equivalent. Continuing practice in spoken German to maintain and upgrade proficiency while completing other requirements for graduation. May be repeated once for credit, but counted only once toward a major.
459. **GERMAN CONTINUING COMPOSITION (1).** Pr., four 300-level German courses, including FL 351 and FL 352, or equivalent. Continuing practice in written German to maintain and upgrade proficiency while completing other requirements for graduation. May be repeated once for credit, but counted only once toward a major.

ITALIAN

- 141-142-143. **FIRST YEAR ITALIAN I-II-III (5-5-5).** FL 141 pr. to 142; 142 pr. to 143. Fundamentals of Italian. Language skills stressed, with progressive emphasis on conversation. Exposure to Italian civilization.
- 241-242-243. **SECOND YEAR ITALIAN I-II-III (5-5-5).** Pr., FL 143 or equivalent. FL 241 pr. to FL 242; FL 242 pr. to FL 243. (Exceptions to this sequence may be granted by departmental consent or when course offerings so require.) Stress on language skills; structural review and composition; readings in Italian literature and exposure to Italian civilization.

PORTUGUESE

- 161-162-163. **FIRST YEAR PORTUGUESE I-II-III (5-5-5).** FL 161 pr. to 162; 162 pr. to 163. Fundamentals of Portuguese. Stress on language skills; progressive emphasis on conversation. Exposure to Luso-Brazilian civilization.
- 261-262-263. **SECOND YEAR PORTUGUESE I-II-III (5-5-5).** Pr., FL 163 or equivalent. FL 261 pr. to 262; 262 pr. to 263. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Stress on language skills; structural review and composition; readings in Luso-Brazilian literature. Exposure to Luso-Brazilian civilization.

RUSSIAN

- 171-172-173. **FIRST YEAR RUSSIAN I-II-III (5-5-5).** FL 171 pr. to 172; FL 172 pr. to 173. Fundamentals of Russian. Stress on language skills; progressive emphasis on conversation. Exposure to Russian civilization.
- 271-272-273. **SECOND YEAR RUSSIAN I-II-III (5-5-5).** Pr., FL 173 or equivalent. FL 271 pr. to 272; FL 272 pr. to 273. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Stress on language skills; structural review and composition. Readings in Russian literature; continued exposure to Russian civilization.
371. **RUSSIAN LITERATURE FROM 1820-1860 IN TRANSLATION (3).** Literary history of the period; selected works by Pushkin, Lermontov, Gogol, Goncharov, Turgenev.
372. **RUSSIAN LITERATURE FROM 1860-1917 IN TRANSLATION (3).** Dostoevsky, Tolstoy, Chekhov.
373. **SOVIET RUSSIAN LITERATURE 1917 TO PRESENT IN TRANSLATION (3).** Gorky, Sholokhov, Mayakovsky, Pasternak, Solzhenitsyn and others.

INTERNSHIPS

499. **FOREIGN LANGUAGE INTERNATIONAL TRADE INTERNSHIP (1-6).** Pr., junior standing and COI. Specific number of hours and applicability toward major to be determined in consultation with the adviser. May be repeated for a maximum of 6 credits.

SPANISH

- 131-132-133. **FIRST YEAR SPANISH I-II-III (5-5-5).** FL 131 pr. to 132; FL 132 pr. to 133. Fundamentals of Spanish. Language skills stressed with progressive emphasis on conversation. Exposure to Hispanic civilization.
- 231-232-233. **SECOND YEAR SPANISH I-II-III (5-5-5).** Pr., FL 133 or equivalent. FL 231 pr. to 232; FL 232 pr. to 233. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Language skills stressed; structural review and composition; reading in Spanish literature; exposure to Hispanic civilization.
238. **INTERMEDIATE SPANISH CONVERSATION (5*).** Pr., FL 133 or equivalent, or approval of Spanish Adviser. Summer. Intensive practice in the spoken language with simultaneous review of vocabulary and structure. May be repeated once for credit but counted only once toward the major.

*This course is taught only in the Auburn Abroad Program.

239. **INTERMEDIATE SPANISH GRAMMAR AND COMPOSITION (5*)**. Pr., FL 133 or equivalent or approval of Spanish Adviser. Summer. Intensive review of Spanish grammar, with emphasis on problem areas and written practice. May be repeated once for credit but counted only once toward the major.
330. **COMMERCIAL SPANISH TRANSLATION (3)**. Pr., FL 233 or equivalent. Fall. The problems and approaches to commercial translation emphasizing the primary areas in which translations are most used: business letter, export-import documentation and conversation.
331. **SPANISH CONVERSATION (3 OR 5**)**. Pr., FL 233 or equivalent. Fall. Intensive practice in the spoken language, with simultaneous review of vocabulary and structure. May be repeated once for credit but counted only once toward a major.
332. **SPANISH COMPOSITION (3 OR 5**)**. Pr., FL 233 or equivalent. Winter. Practice in writing letters, brief articles, themes and reports, based on original composition and translation. May be repeated once for credit but counted only once toward a major.
333. **SPANISH AMERICAN CIVILIZATION I (3)**. Pr., FL 233 or equivalent. Alternate Fall. Intensive exposure to the culture of pre-Colombian Spanish America to Independence as reflected in the fine arts and literature. Emphasis on geographic, historical, social, artistic, spiritual, and political forces in Spanish American civilization and its contribution to world cultures.
334. **SPANISH AMERICAN CIVILIZATION II (3)**. Pr., FL 233 or equivalent. Alternate Winter. Intensive exposure to the culture of Spanish America from Independence to the twentieth century as reflected in the fine arts and literature. Emphasis on geographic, historical, social, artistic, spiritual, and political forces in Spanish American civilization and its contribution to world cultures.
335. **SPANISH AMERICAN CIVILIZATION III (3)**. Pr., FL 233 or equivalent. Alternate Spring. Intensive exposure to the culture of contemporary Spanish America as reflected in the fine arts and literature. Emphasis on geographic, historical, social, artistic, spiritual, and political forces in Spanish American civilization and its contribution to world cultures.
336. **SPANISH CIVILIZATION I (3 OR 5**)**. Pr., FL 233 or equivalent. Intensive exposure to the culture of Spain up to 1700 as reflected in the fine arts and literature. Emphasis on geographic, historical, social, artistic, spiritual, and political forces in Spanish civilization and its contribution to world cultures. Alternate Fall.
337. **SPANISH CIVILIZATION II (3 OR 5**)**. Pr., FL 233 or equivalent. Alternate Winter. Intensive exposure to the culture of Spain from 1700 to the present, as reflected in the fine arts and literature. Emphasis on geographic, historical, social, artistic, spiritual, and political forces in Spanish civilization and its contribution to world cultures.
338. **SEMINAR IN ADVANCED COMPOSITION AND CONVERSATION (3 OR 5**)**. Pr., FL 233 or equivalent. Summer. Intensive practice in composition and conversation through original and directed themes as well as through oral presentations. May be repeated once for credit.
339. **BUSINESS SPANISH (3 OR 5**)**. Pr., FL 233 or equivalent. Intensive practice in preparing commercial correspondence and reading contracts, agreements, and related documents in Spanish. Emphasis will be placed on the acquisition of a business-oriented vocabulary.
340. **SPANISH-AMERICAN COMMUNITY DIALOGUE (3)**. Pr., FL 331 or FL 332. Practical Spanish for American public safety personnel with emphasis on learning key phrases useful when handling situations involving authoritative intent, cooperation, or offering of assistance. Medical and legal terminology including specific vernacular and idiom variations. Offering TBA odd years starting 1983.
430. **SPANISH FOR INTERNATIONAL TRADE (3)**. Pr., FL 339 or equivalent. Practice in handling, preparing and translating international trade correspondence and documents in Spanish. Development of case studies and other realistic international trade group work in Spanish and English, under simulated real-life pressures.
431. **SURVEY OF SPANISH LITERATURE TO 1700 (3)**. Pr., FL 233 or equivalent. Fall. Development of Spanish literature from its beginnings through the Golden Age (1700).
432. **SURVEY OF MODERN SPANISH LITERATURE (3)**. Pr., FL 233 or equivalent. Panorama of Spanish literature between 1700 and 1900. Alternate Winter.
433. **SURVEY OF CONTEMPORARY SPANISH LITERATURE (3)**. Pr., FL 233 or equivalent. Panorama of the development of contemporary Spanish literature from the Generation of '98 to the present. Alternate Spring.
434. **SURVEY OF SPANISH AMERICAN LITERATURE I (3)**. Pr., FL 233 or equivalent. Panorama of Spanish American literature from the discovery of America to Modernism. Alternate Fall.
435. **SURVEY OF SPANISH AMERICAN LITERATURE II (3)**. Pr., FL 233 or equivalent. Panorama of Spanish American literature from Modernism to the present. Alternate Winter.
437. **SEMINAR IN HISPANIC LITERATURE (3 OR 5*)**. Pr., four 300-level Spanish courses or equivalent. Readings in Hispanic literature from selected genres, authors, periods, or movements. May be repeated once for credit.
438. **SPANISH CONTINUING CONVERSATION (1)**. Pr., FL 331 and FL 332, or equivalent. Continuing practice in spoken Spanish to maintain and upgrade proficiency while completing other requirements for graduation. May be repeated once for credit.

*This course is offered only in the Auburn Abroad Program.

**300, 500 and 600-level French and Spanish courses will carry five quarter hours of credit only when taken in the Auburn Abroad Program.

439. **SPANISH CONTINUING COMPOSITION (1).** Pr., FL 331 and FL 332, or equivalent. Continuing practice in written Spanish to maintain and upgrade proficiency while completing other requirements for graduation. May be repeated once for credit; but counted only once toward a major.
499. **FOREIGN LANGUAGE INTERNATIONAL TRADE INTERNSHIP (1-6).** Pr., junior standing and COI. Specific number of hours and applicability toward major to be determined in consultation with the adviser. May be repeated for a maximum of 6 credits.

FRENCH ADVANCED UNDERGRADUATE AND GRADUATE COURSES

520. **FRENCH FOR INTERNATIONAL TRADE (3).** Pr., FL 329 or equivalent. Practice in handling, preparing and translating international trade correspondence, documents and related legal procedures in French. Development of case studies and other international trade group work in French and in English, under simulated real-life pressures.
521. **ADVANCED FRENCH CONVERSATION AND PHONETICS (3 OR 5**).** Pr., four 300-level French courses or equivalent. Training in oral French to increase vocabulary, improve fluency and pronunciation. May be repeated once for credit.
522. **ADVANCED FRENCH COMPOSITION AND STYLISTICS (3 OR 5**).** Pr., four 300-level courses or equivalent. Exercise in advanced grammar and syntax designed to enhance the student's linguistic ability. Practice in composition, *explication de texte*, and in the use of stylistic devices derived from significant literary sources. May be repeated once for credit.
523. **ADVANCED FRENCH CIVILIZATION (3 OR 5**).** Pr., four 300-level French courses or equivalent. An indepth study of French civilization, with emphasis on the relationship of history, arts, and literature from the Middle Ages to the present.
524. **FRENCH TRANSLATION SKILLS (3).** Pr., four 300-level French courses. Exercises and training in techniques of French-English/English-French translation.
525. **FRENCH LITERATURE AND CIVILIZATION OUTSIDE CONTINENTAL FRANCE (3).** Pr., four 300-level French courses or equivalent. Consideration of civilization and analysis and criticism of selected French literature from Africa, the Antilles, Canada, and other French-speaking areas.
526. **SEMINAR IN ADVANCED LANGUAGE SKILLS (3 OR 5**).** Pr., four 300-level French courses or equivalent. Practice in writing and speaking French. Exercises include compositions and exposés. May be repeated once for credit.
527. **SEMINAR IN FRENCH LITERARY GENRES AND MOVEMENTS (3 OR 5**).** Pr., four 300-level French courses or equivalent. Intensive readings in French literature from selected genres or movements.
529. **ADVANCED FRENCH OR QUEBECOIS CIVILIZATION (5).** Pr., four 300-level French courses or equivalent. Summer. An indepth study of French or Quebecois civilization, with emphasis on historical, political, and cultural influences. To be offered only in Auburn Abroad Program. Quebecois civilization will be treated when the Program is conducted in Montreal.

SPANISH ADVANCED UNDERGRADUATE AND GRADUATE COURSES

530. **MIDDLE AMERICAN SHORT STORY (3).** Pr., four 300-level Spanish courses or equivalent. The short story in Middle America, with emphasis on the modern and contemporary periods.
531. **SOUTH AMERICAN SHORT STORY (3).** Pr., four 300-level Spanish courses or equivalent. The short story in South America, with emphasis on the modern and contemporary periods.
532. **MIDDLE AMERICAN THEATER (3).** Pr., four 300-level Spanish courses or equivalent. The theater in Middle America, with emphasis on the contemporary period.
533. **SOUTH AMERICAN THEATER (3).** Pr., four 300-level Spanish courses or equivalent. The theater in South America, with emphasis on the contemporary period.
534. **CERVANTES (3).** Pr., four 300-level Spanish courses or equivalent. The prose works of Cervantes with special emphasis on *Don Quixote*.
535. **CONTEMPORARY SPANISH POETRY (3).** Pr., four 300-level Spanish courses or equivalent. Spanish poetry since 1900.
536. **CONTEMPORARY SPANISH THEATER (3).** Pr., four 300-level Spanish courses or equivalent. The Spanish theater since 1900.
537. **CONTEMPORARY SPANISH PROSE FICTION (3).** Pr., four 300-level Spanish courses or equivalent. The development of prose fiction from the eighteenth century to modern times.
538. **CONTEMPORARY SPANISH-AMERICAN POETRY (3).** Pr., four 300-level Spanish courses or equivalent. Poetic forms, leading movements, and principal poets in Spanish America since Modernism.
539. **SEMINAR IN COMPOSITION AND STYLISTICS (3 OR 5**).** Pr., four 300-level Spanish courses or equivalent. Advanced training in composition and stylistics with specific course materials determined by needs of students. May be repeated once for credit.
540. **SEMINAR IN CONVERSATION AND PHONETICS (3 OR 5**).** Pr., four 300-level Spanish courses or equivalent. Advanced training in conversation and phonetics with specific course materials determined by needs of students. May be repeated once for credit.

**500 and 600-level French and Spanish courses will carry five quarter hours of credit only when taken in the Auburn Abroad Program.

GRADUATE COURSES IN FRENCH AND SPANISH

A non-sequential offering of courses required of students pursuing the degrees of Master of Arts in French, Master of Arts in Spanish, Master of French Studies, Master of Hispanic Studies, and Master of Arts in College Teaching. Representative works, literary movements, and techniques of literary criticism within respective genres of French, Spanish American, and Spanish literature are emphasized and analyzed in depth. A background in the history of the French language and of the Spanish language is presented and required of all Master's candidates. Courses may be taken concurrently.

FRENCH GRADUATE COURSES

620. **SPECIAL TOPICS IN FRENCH LITERATURE, CULTURE OR LANGUAGE (3).** Focus on special aspects of French literature or culture along with social, political, intellectual issues, and cultural reflections, or an in depth study of French syntax, morphology or phonetics. The specific focus of this course will be announced at least one quarter prior to its being scheduled. May be repeated once for credit.
621. **MEDIEVAL FRENCH LANGUAGE, LITERATURE, AND CIVILIZATION (3).** A brief introduction to the history of the French language and the development of Medieval French literature in the light of the history, thought, and art of that period.
622. **SIXTEENTH-CENTURY FRENCH LITERATURE AND CIVILIZATION (3).** The development of French literature during the sixteenth-century in the light of French history, thought, and art of that period.
623. **SEVENTEENTH-CENTURY FRENCH LITERATURE AND CIVILIZATION (3).** The development of French literature during the seventeenth century in the light of French history, thought, and art of that period.
624. **EIGHTEENTH-CENTURY FRENCH LITERATURE AND CIVILIZATION (3).** The development of French literature during the eighteenth-century in the light of French history, thought, and art of that period.
625. **NINETEENTH-CENTURY FRENCH LITERATURE AND CIVILIZATION (3).** The development of nineteenth-century French literature in the light of French history, thought, and art from 1801 to 1870.
626. **NINETEENTH AND TWENTIETH-CENTURY FRENCH LITERATURE AND CIVILIZATION (3).** The development of French literature in the light of French history, thought, and art from 1871 to 1914.
627. **TWENTIETH-CENTURY FRENCH LITERATURE AND CIVILIZATION (3).** The development of twentieth-century literature in the light of French history, thought and art from 1915 to the present.
628. **FRENCH LITERARY GENRES OR THEMES (3).** A particular genre or theme throughout French literature. The specific subject of the courses will be announced one quarter prior to its being scheduled.
629. **THE FRENCH PRESS (3).** The intellectual, cultural, and political events in France and the world as reflected in major French newspapers and magazines.
660. **RESEARCH METHODS (1).** An introduction to the methods of scholarly investigation in literary history and criticism. Special emphasis is given to practical training in the use of bibliographical resources and in the preparation of formal written presentations of research results.
661. **FRENCH PHONETICS, PRONUNCIATION AND DICTION (3).** Exercises and training in advanced techniques of French phonetics, pronunciation, and diction.
662. **FRENCH STYLISTICS AND EXPLICATION DE TEXTE (3).** Exercises and training in advanced techniques of French *explication de texte*, stylistics and writing skills.
663. **INTRODUCTION TO COLLEGE-LEVEL FRENCH INSTRUCTION (1).** Instruction for graduate teaching assistants including critical observation of performance and guidance by a designated supervisory professor. May be repeated for a maximum of two credits.
664. **DIRECTED READINGS IN FRENCH LITERATURE (1-3).** Supervised study in specialized areas. Registration is by permission of the department and the instructor. May be repeated for credit.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**

SPANISH GRADUATE COURSES

630. **HISTORY OF THE SPANISH LANGUAGE (3).** The history of the language from its Latin origins to the present day. Phonological, morphological, syntactic and lexical developments are traced. External factors affecting these developments are considered as well.
631. **MEDIEVAL SPANISH LITERATURE (3).** An introduction to medieval Spanish literature and the language in which it was composed. Representative samples of texts from the different genres are read and examined mainly from a literary viewpoint.
632. **EARLY DEVELOPMENT OF THE SPANISH THEATER (3).** A critical and historical study of the development of the theater from the *Auto de Los Reyes Magos* through Lope de Vega.
633. **GOLDEN AGE SPANISH THEATER (3).** A critical and historical study of the theater of the seventeenth century after Lope de Vega.
634. **EIGHTEENTH AND NINETEENTH-CENTURY SPANISH THEATER (3).** An intensive study of the Spanish theater from 1700 to 1900.

635. **RENAISSANCE — GOLDEN AGE SPANISH PROSE FICTION (3).** A critical and historical study of the prose fiction of the Renaissance and Golden Age through representative authors.
636. **RENAISSANCE — GOLDEN AGE SPANISH POETRY (3).** Spanish poetry from the Renaissance to 1700.
637. **EIGHTEENTH AND NINETEENTH-CENTURY SPANISH POETRY (3).** Spanish poetry from 1700 to 1900.
638. **MIDDLE AMERICAN NOVEL (3).** The modern and contemporary novel in Middle America.
639. **SOUTH AMERICAN NOVEL (3).** The modern and contemporary novel in South America, excluding the River Plate region.
640. **RIVER PLATE REGION NOVEL (3).** The modern and contemporary novel of the River Plate region in South America.
641. **DEVELOPMENT OF SPANISH-AMERICAN POETRY THROUGH MODERNISM (3).** The development of poetic forms, of leading movements and principal poets in Spanish America from the pre-Columbian epoch through Modernism.
642. **SEMINAR IN HISPANIC LITERATURE (3 or 5***).** Intensive readings in Hispanic literature from selected genres, authors, periods or movements. May be repeated once for credit.
643. **DIRECTED RESEARCH (1).** Study and research in specialized areas under the direct supervision of one faculty member. Registration by permission only. May be repeated twice for credit.
644. **INTRODUCTION TO COLLEGE-LEVEL SPANISH INSTRUCTION (1).** Instruction for graduate teaching assistants including critical observation in performance and guidance by a designated supervisory professor. May be repeated for a maximum of two credits. This course may not be counted towards a graduate degree.
645. **RESEARCH METHODS (1).** An introduction to the methods of scholarly investigation in literary history and criticism. Special emphasis is given to practical training in the use of bibliographical sources and in the preparation of research papers. This course may not be counted toward a graduate degree.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**

Forest Engineering (FYE)

Professors Thompson and Turnquist
Associate Professors Lanford and Turner
Assistant Professors Fridley and Tufts

304. **FOREST SURVEYING (5).** LAB. 15. Pr., MH 162 and FYE 306 or an approved mechanical drawing course. Summer. Basic concepts and procedures of surveying as applied to forestry.
306. **FOREST CARTOGRAPHY (1).** LAB. 3. Pr., Spring. Basic concepts and procedures of drafting planimetric and topographic maps.
401. **FOREST MACHINERY (3).** LEC. 3. Pr., AN 311, ME 316. Spring. Power requirements, design aspects, hydraulic systems, testing, rating and use of forest machinery. Vehicle-Terrain relationships. (Same as AN 401.)
402. **FOREST ROADS DESIGN (3).** LEC. 2, LAB. 3. Pr., FYE 304. Fall. Design, construction and maintenance of secondary and temporary road systems with an emphasis on preconstruction planning and design. Includes earth work calculations, drainage structures and erosion control. (Same as AN 402.)
403. **AGRICULTURAL AND FOREST STRUCTURES DESIGN (3).** LEC. 2, LAB. 3. Pr., ME 316. Fall. Analysis and design of structural systems of agriculture and forestry. (Same as AN 403.)
430. **AGRICULTURAL AND FOREST ENGINEERING DESIGN I (3).** LEC. 2, LAB. 3. Pr., ME 316, senior standing, COI. Winter. Design of equipment, structures, and systems for food, feed, fiber, forest products, and animal production utilizing engineering principles. (Same as AN 430.)
490. **SPECIAL TOPICS (2-5).** (CREDIT TO BE ARRANGED.) Pr., COI. May be taken more than one quarter for a maximum of 10 quarter hours. (Same as AN 490.)

ADVANCED UNDERGRADUATE AND GRADUATE

517. **PHOTOGRAMMETRY (5).** LEC. 3, LAB. 6. Pr., FYE 306, FY 415 or COI. Fall, Spring. Use of aerial photographs in Forestry. Particular emphasis is placed on specifications for forestry photographs, basic map control, planimetric mapping, timber type mapping and timber volume estimation.
530. **AGRICULTURAL AND FOREST ENGINEERING DESIGN II (3).** LEC. 1, LAB. 6. Pr., ME 316, senior or graduate standing, COI. Design of equipment, structures, and systems for agricultural and forestry situations utilizing engineering principles. (Same as AN 530.)
570. **HARVESTING (3).** LEC. 2, LAB. 3. Pr., EE 201, FY 415, 520, 540. Winter. Harvesting systems, cost analysis, and environmental impacts.
571. **ADVANCED HARVESTING (3).** LEC. 3. Pr., FY 570 or COI. Spring. Combines basic fundamentals of harvesting into analysis of systems. Looks at specific harvesting problems and their solutions. Gives additional attention to topics introduced in FYE 570.

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590. **SPECIAL TOPICS. (CREDIT TO BE ARRANGED.) (2-5).** Pr., COI. May be taken more than one quarter for a maximum of 10 quarter hours. (Same as AN 590.)

GRADUATE

617. **REMOTE SENSING (3).** LEC. 2, LAB. 3. Pr., PS 206 or PS 221, BY 513 or FY 421, and COI. Spectral regions. Reflectance and emission of electro-magnetic energy. Types of remote sensing systems, including: photographic, in the visible and infrared spectral regions; line-scanning in the visible, infrared, and microwave spectral regions; and radar. The applications of remote sensing imagery to non-urban management.
690. **SPECIAL TOPICS. (CREDIT TO BE ARRANGED.) (2-5)** Pr., COI. May be taken more than one quarter for a maximum of 10 quarter hours. (Same as AN 690.)

Forest Management (FY)**

Professors Thompson and Johnson

Adjunct Professor Mitchell

Associate Professors Flick, Gjerstad, Golden, Larsen, and Lyle

Assistant Professors Brewer, Caulfield, Davis, DeBrunner, Glover, and Meldahl

300. **INTRODUCTION TO FORESTRY (1).** LEC. 1. Summer. An orientation course for persons entering the forest management or forest engineering curriculum. Basic forestry concepts of multiple use and sustained yield. Problems of timber harvesting, regeneration, manufacturing, water, wildlife, range, and recreational management, and major careers for professional foresters.
301. **DENDROLOGY I (3).** LAB. 9. Pr., BI 102, Summer. Taxonomy and identification of important forest plants of the United States.
302. **FOREST BIOLOGY (2).** LAB. 6. Pr., BI 102, Summer. Field exposure to important principles of forest biology and some examples of their practical applications to forest resource management.
305. **FIELD MENSURATION (4).** LAB. 12. Pr., MH 162, Summer. Basic concepts and procedures for measuring trees and stands, units of measure used in forestry; application of log rules and volume tables; condition class mapping; elementary timber estimating.
313. **SAMPLING I (4).** LEC. 3, LAB. 3. Pr., FY 305, FYE 304, 306, MH 163, Fall, Winter. Basic concepts and procedures of statistical sampling as applied to forest resource assessment and management. Same as BST 313.
314. **SAMPLING II (4).** LEC. 3, LAB. 3. Pr., FY 313, CSE 204, Winter, Spring. Continuation of Sampling I.
320. **FOREST TREE PHYSIOLOGY (3).** LEC. 3. Pr., CH 104, FY 301, 302, PS 200 or COI, Fall, Winter. Relationship between environmental and genetic factors. Metabolism and growth of individual trees.
350. **FARM FORESTRY (5).** LEC. 5. Pr., sophomore standing, Fall, Winter, Spring, Summer. (Not open to students in Forestry curricula.) The place of farm forests in agricultural economy. The application of forestry principles to the problems of the farm woodland, especially as they relate to Alabama conditions.
400. **FORESTRY TOUR (3-9).** LAB. (1-3). Tours up to 2 weeks long to points of outstanding interest to foresters. May be taken more than once if different tours are involved.
415. **FOREST MENSURATION (5).** LEC. 3, LAB. 6. Pr., FY 313 and CSE 204, Coreq. FY 314, Spring. Basic concepts and mathematical rationale underlying the measurement and estimation of various forest resources. Estimation of tree and stand growth and future yields.
421. **FOREST ECOLOGY (5).** LEC. 4, LAB. 3. Pr., AY 305, FY 314, 320, GL 110 or COI, Spring. Basic concepts and principles of forest ecology including forest community-environment relationships.
422. **FOREST GEOGRAPHY (2).** LEC. 2. Pr., or Coreq. FY 421, Winter, Spring. Silvical characteristics of specific tree species. Major forest types of the U.S.
424. **DENDROLOGY II (1).** LAB. 3. Pr., FY 301, Fall. A continuation of FY 301, providing further practice in field identification of woody plants with coverage of additional species.
445. **FOREST FIRE CONTROL AND USE (3).** LEC. 2, LAB. 3. Pr., EC 202 or AEC 206, FY 421, or COI, Winter. Forest fire protection and use of fire by prescription including purpose, organization, equipment, economics, methods and tactics, public relations, and fire services management principles.
460. **WILDLAND RECREATION PHILOSOPHY AND POLICY (3).** LEC. 3. Spring. Philosophy and policy of wildland recreation. Laws and traditions at federal, state, and local levels of government as well as industrial and other landowners' outlooks and developments relative to wildland recreation.
462. **FOREST RECREATION PLANNING AND MANAGEMENT (3).** LEC. 2, LAB. 3. Pr., FY 300, FY 301, FY 302, Fall, Spring. Planning for and management of lands which can provide recreational opportunity for people.
480. **FOREST PROBLEM I (0).** LAB. 6. Pr., FY 415, 520, 540. Offered only under the "Satisfactory/Unsatisfactory" option. Winter. Definition, analysis, and solution of a forestry oriented problem. This is the first part of a two part exercise requiring two consecutive quarters for completion. Completion of the first part with a grade of "S" is prerequisite for part II.
481. **FOREST PROBLEM II (4).** LAB. 6. Pr., FY 480, 541, Spring. Continuation of FY 480.

**The prerequisites may be waived by consent of the instructor concerned, for junior and senior students in other departments.

482. **WOOD PROCUREMENT (2).** LAB. 4. Pr., FY 541 or COI. Spring. Principles, problems, and practices involved in providing raw material to the forest products industry.
495. **DIRECTED STUDY (1-5 each).** Pr., COI, and approval of department head, junior standing. Maximum of 10 hours in all areas as credit toward the Bachelor of Science degree. Areas of study defined as in FY 691
499. **HONORS PROJECT (2-5).** Senior standing. A problem in the student's area of interest. Will test ability to do thorough library research, field work, data analysis, or other tasks related to high level independent work.

ADVANCED UNDERGRADUATE AND GRADUATE

520. **SILVICULTURE (5).** LEC. 3, LAB. 6. Pr., FY 421 or COI. Fall. Methods of controlling establishment, composition, growth, and quality of forest stands. Application of ecological principles to manipulation of forest ecosystems to meet specific objectives.
521. **FOREST SOILS (5).** LEC. 3, LAB. 6. Pr., AY 305, FY 520. Summer. Use of soil science principles in forest management. Principles of forest site evaluation, forest land classification, nutrient cycling, forest fertilization, erosion control, forest soil degradation and plant establishment.
526. **FOREST WATERSHED MANAGEMENT (3).** LEC. 2, LAB. 3. Pr., GL 110, AY 305 and FY 421 or BY 513. Winter. A survey of forest hydrology as a specialized branch of forest ecology. The use of forests and forestry practices for the regulation of streamflow. An overnight field trip is required.
540. **FOREST ECONOMICS (4).** LEC. 3, LAB. 3. Pr., EC 202 or AEC 206, FY 415, or COI. Fall. Marginal analysis applied to forestry. Investment theory and forestry decisions. Theories of resource supply and economics of conservation. The structure and performance of forest products markets. The principles and influence of taxation in forestry. The U.S. as a component of the world forest economy.
541. **FOREST MANAGEMENT AND ADMINISTRATION (4).** LEC. 3, LAB. 3. Pr., FY 520, FY 540. Winter. A modern course in quantitative approaches to decision making in forestry. Models for resource regulation, multiple objective planning, and other selective forestry problems. Decision making in private and public forestry firms/agencies. The administration of large forestry programs and the influence of outside regulations. Course will rely heavily on previous forestry courses.
542. **FOREST POLICY (3).** LEC. 3. Pr., FY 541 or COI. Spring. Analysis of the major social and resource characteristics of the forest regions of the U.S. Identification of policy issues at regional and national levels. Historical aspects of the U.S. forest policy. Analysis of major policy institutions.
548. **ADVANCED FOREST ECONOMICS (3).** LEC. 3. Pr., FY 540. Winter. Input-output relationships in forest production. Computation of financial maturity of trees and stands. Competition for resources in the management of forest properties. Uses of land and evaluation of intangible values associated with land.
590. **SEMINAR IN FORESTRY (1).** Pr., senior standing. Advanced current literature and recent developments, with written and verbal reports on selected problems.
593. **PRACTICUM (1-5).** May be repeated not to exceed 10 hours credit. Not open to majors in Forestry curricula. Provides students with experience in Forestry closely relating theory and practice, usually carried out simultaneously.

GRADUATE

610. **FOREST TREE IMPROVEMENT (5).** LEC. 4, LAB. 3. Pr., ZY 300 or COI. Principles of heredity as applied to forest trees and their management. Review of current knowledge in tree improvement. Principles of forest tree breeding. Study and evaluation of activities designed to produce genetically improved trees.
611. **ADVANCED FOREST SOILS (5).** LEC. 3, LAB. 6. Pr., AY 305 or 307. Importance of morphological, physical and chemical properties of forest soils in relation to growth of trees. Classification of forest soils on the basis of productivity. Special emphasis on forest soils in the southern pine region.
613. **FOREST COMMUNITY INVESTIGATIONS (5).** LEC. 2, LAB. 8. Pr., GL 110, or AY 307 or 305; FY 421 or BY 513. Methods of detecting, measuring, describing and analyzing forest communities and community types. Application to the study of forest ecosystems.
641. **ECONOMICS OF FORESTRY I (3).** LEC. 3. Pr., EC 601 or COI. Economics of forestry in relation with natural resource economics, capital theory and investment analysis in forestry contexts, principles of decision making, scheduling forest management activities.
642. **ECONOMICS OF FORESTRY II (3).** LEC. 3. Pr., EC 601 or COI. Forest resource supply models, demand for forest products, structure, and performance of U.S. forest industry, and international forestry.
643. **ECONOMICS OF FORESTRY III (3).** LEC. 3. Pr., EC 601 and EC 556 or COI. Regional analysis of U.S. forest economy, economic and legislative history of American forestry, analysis of public and private forest policies including forest taxation.
690. **GRADUATE SEMINAR (1).** Pr., graduate standing. Presentation and discussion of advanced topics in forest management, forest engineering, and forest products.
691. **DIRECTED STUDY (1-5).** Directed Study limited to a maximum of 5 hours in any specified area and to a maximum of 15 hours in all areas as credit towards Master's or doctoral degrees. All quarters. Areas of Directed Study: (A) Forest Management, (B) Forest Economics, (C) Forest Sampling, (D) Regression Analysis, (E) Linear Programming, (F) Forest Photogrammetry, (G) Forest Mensuration, (H) Forest Engineering, (I) Forest Soils, (J) Forest Ecology, (K) Forest Genetics, (L) Tree Physiology, (M) Wood Anatomy & Quality, (N) Uses of Wood & Derived Products, (O) Chemistry of Wood Glues, Finishes, & Impregnants, (P) Timber Physics, (Q) Recreation, (R) Remote Sensing, and (S) Wood Procurement.

695. **SPECIAL PROBLEMS (3-8).** Area of study defined in FY 691. All quarters. A special problem in forestry or wood utilization. Such a problem will be of lesser magnitude than a thesis but will test the student's ability to do thorough library research as well as any needed laboratory or field work, and to prepare a comprehensive report on his findings. This work may be spread over more than one quarter, but shall be limited to a total of eight quarter hours.
698. **MASTER OF FORESTRY PAPER.** (CREDIT TO BE ARRANGED.)
699. **RESEARCH AND THESIS.** (CREDIT TO BE ARRANGED.)
799. **RESEARCH AND DISSERTATION.** (CREDIT TO BE ARRANGED.)

Forest Products (FP)

Professors Biblis and Tang

Associate Professor Beals

Assistant Professors Carino and Elder

206. **WOOD MEASUREMENTS (3).** LEC. 2, LAB. 3. Pr., MH 161. Fall. Wood measurements and tree identification oriented toward the needs of students in Forest Products and Wood Science.
301. **INTRODUCTION TO FOREST PRODUCTS AND WOOD SCIENCE (5).** LEC. 5. (Not open to students in Forestry curricula.) Introduction to fundamentals in Wood Science and Technology; Utilization and manufacture of major forest products.
302. **WOOD AND WOOD PRODUCTS IN FURNITURE AND HOUSE INTERIORS (3).** LEC. 3. Spring. Present an understanding of the relationship between the properties of various wood materials and their function when used as components of furniture and house interiors.
311. **STRUCTURE OF WOOD (5).** LEC. 3, LAB. 6. Spring. Structure of woods at macroscopic and microscopic level, emphasizing microstructure of cell wall and its effect on wood properties. Introduction to microtechniques.
330. **SOLID WOOD PRODUCTS (3).** LEC. 3. Pr., FP 311. Winter. Manufacturing, specifications, and grading of solid wood products derived from forest lands. Field trips will be required.
370. **WOOD AS AN ART MEDIUM (3).** LEC. 1, LAB. 4. For students majoring in the Fine Arts. Winter. Basic technology and properties of wood as applied to its use as an art medium. Wood identification, design of wood forms, and effects of moisture on the dimensional stability of wood. Design problems involving wood.
439. **WOOD IDENTIFICATION AND PRODUCTS (3).** LEC. 2, LAB. 3. Pr., FY 301. Fall, Winter. The manufacture of lumber, plywood, paper, and various composition boards from wood. Modern production technologies used in forest products industries. Identification of important products and woods.
474. **WOOD GLUING AND COATING (3).** LEC. 2, LAB. 3. Pr., FP 311, FP 330. Concurrently. Winter. Types and characteristics of adhesives and wood coating materials. Use of adhesives and wood coating materials in primary and secondary wood products manufacture operations.
475. **WOOD-BASED PANEL TECHNOLOGY (3).** LEC. 2, LAB. 3. Pr., FP 311, FP 330. Spring. Design, manufacture, properties and application of plywood, particle-board, fiberboard and composite panels.
477. **PULP AND PAPER TECHNOLOGY (3).** LEC. 2, LAB. 3. Pr., FP 311. Fall. Pulping processes, fiber refining and processing, manufacture of paper, fiber and paper properties, recycling of paper and water requirements, and effluent treatment.
478. **INTRODUCTION OF WOOD CHEMISTRY (3).** LEC. 2, LAB. 3. Pr., CH 203, FP 311. Winter. Chemical composition of wood, chemical analyses of wood components and their derivatives and utilization. Energy from wood and forest residues.

ADVANCED UNDERGRADUATE AND GRADUATE

513. **MICROTECHNIQUES OF HARD MATERIALS (5).** LEC. 1, LAB. 12. Pr., FY 311 or COL. Preparation and sectioning of hard materials for microscopic study. Care and use of the sliding microtome and diamond saw, staining, counterstaining and mounting of sections.
525. **PHYSICAL PROPERTIES OF WOOD (4).** LEC. 2, LAB. 3. Pr., PS 206, FP 311. Fall. Wood-moisture relationships, diffusion, permeability, plasticization, density and specific gravity. Thermal, electrical and acoustical properties of wood.
531. **MECHANICAL PROPERTIES OF WOOD (4).** LEC. 3, LAB. 4. Pr., FP 311. Winter. Mechanical properties of wood, factors affecting the strength of wood, principles used in design of wood structure. Testing procedures.
532. **DETERIORATION AND WOOD TREATING PROCESSES (3).** LEC. 3. Pr., FP 311. Fall. Biological deterioration of wood and wood products. Wood preservatives and industrial treating processes of wood products. Field trips will be required.
533. **WOOD DRYING PROCESSES (3).** LEC. 2, LAB. 3. Pr., FP 525. Winter. Physical principles of kiln drying, industry drying methods and procedures, drying defects and its prevention.
534. **MECHANICS & STRUCTURAL DESIGN WITH WOOD PRODUCTS (4).** LEC. 3, LAB. 3. Pr., FP 475, FP 531. Spring. Engineering design and mechanical behaviors of solid wood and composite wood structural members as applied to building construction.

535. **FOREST PRODUCTS PRODUCTIONS MANAGEMENT AND CONTROL (3).** LEC. 2, LAB. 3. Pr., FP 475, MN 310. Spring. The concepts, techniques and functions of forest products production management and manufacturing process control. Use of computer for process simulation and analysis.
536. **FOREST PRODUCTS MARKETING (3).** LEC. 3. Pr., FP 330, FP 475. Winter. Historical and current analyses of forest products marketing at manufacturing, wholesale and retail level. Applications of marketing systems to forest products industries.
537. **POLLUTION PROBLEMS IN THE FOREST INDUSTRY (3).** LEC. 3. *Senior standing.* Spring. The causes and the control of pollution problems associated with the forest industries. Air, water, noise and solid-waste problems are identified during the conversion of wood and forest residues into the forest products and energy. Special topics from industrial members.

GRADUATE

601. **ADVANCED WOOD CHEMISTRY (5).** LEC. 3, LAB. 6. Pr., FP 478 or COI. Spring. Detailed study of the physical and chemical nature of cellulose and modified cellulose and their derivatives. Study of the lignocellulose complex. The chemical analysis of wood.
602. **ADVANCED WOOD ANATOMY (4).** LEC. 3, LAB. 3. Pr., FP 311. Winter. Physico-chemical properties of wood and fibers as related to ultra-structures and composition. Application of various techniques in microscopy to wood anatomy.
603. **PHYSICS OF WOOD AND WOOD COMPOSITES (4).** LEC. 4. Pr., FP 525. Fall. Theory of permeability and transport in wood. Hygrothermophysics of wood and its composites. Acoustics of timber and wood composite structures, and piezoelectric properties of wood.
604. **MECHANICS OF WOOD AND WOOD COMPOSITES (4).** LEC. 4. Pr., FP 531, ME 207 or COI. Spring. Micro- and macromechanical behavior of wood and its composites. Stress-strain relationships in wood fibers and wood composites. Phenomena of fracture and fatigue in wood and its composites.
605. **ADHESIVE BONDING OF WOOD COMPOSITES (4).** LEC. 3, LAB. 3. Pr., FP 531, FP 474. Winter. Theory of adhesion and technology of adhesive bonding. Practice of manufacturing composition wood materials and its bonding strength evaluation.
606. **ADVANCED FOREST PRODUCTS PRODUCTION MANAGEMENT AND CONTROL (4).** LAB. 3, LAB. 3. Pr., FP 535. Fall. Mathematical models in operational research, with applications to the problems in forest products industries such as manufacturing processes, production control, forecasting, inventory analysis and decisions analysis.
691. **DIRECTED STUDY (1-5).** Directed study limited to 5 hours in any specified area and to a maximum of 15 hours in all areas as credit towards the Master's or Doctoral degrees. Areas of Directed Study: (a) Physical, (b) Chemical, (c) Mechanical Properties of Wood, and (d) Processing of Forest Products.
695. **SPECIAL PROBLEMS (3-8).** Areas of study defined in FP 691. A special problem in forest products/wood science. Such a problem will be of lesser magnitude than thesis but will test the student's ability to do thorough library research as well as any needed laboratory or field work, and to prepare a comprehensive report on his findings. This work may be spread over more than one quarter, but shall be limited to a total of eight quarter hours.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Foundations of Education (FED)

Professors G. M. Halpin, G. W. Halpin, Lauderdale, and Littleford

Associate Professors Spencer, Head, Deaton, Greenshields, Miller, Trentham, and Wilmoth
Instructors Bentley, Hannan, and Herring

213. **HUMAN GROWTH AND DEVELOPMENT (5).** LEC. 4, LAB. 2. Pr., sophomore standing. Teacher and the school in the direction, measurement, and evaluation of individual growth and development by using various sociological, philosophical, and psychological theories. Laboratory experiences required.
214. **PSYCHOLOGICAL FOUNDATIONS OF EDUCATION (5).** LEC. 4, LAB. 2. Pr., sophomore standing. The psychological dimensions of the educational process. The processes, conditions, and evaluation of learning, and related methodologies of teaching. Laboratory experiences and evaluation of the Pre-teaching Field Experience. For description of the Pre-teaching Field Experience Program, see Professional Requirements, Sect. C under School of Education.
300. **EDUCATIONAL PSYCHOLOGY (5).** LEC. 4, LAB. 2. Pr., sophomore standing. Learning and motivation from a developmental perspective for the purpose of gaining insight into an understanding of the learning process and of the individual involved in this process. This experience provides an integrated theoretical base for educational practice. Enrollment limited to education majors.
320. **SOCIAL FOUNDATIONS OF EDUCATION (5).** LEC. 4, LAB. 2. Pr., junior standing. The relationship of the school and contemporary society and the influence of cultural heterogeneity upon the teaching-learning process. Laboratory experiences focus upon mastering basic tools for studying the school as a dynamic social system.
350. **CULTURAL FOUNDATIONS OF EDUCATION (5).** LEC. 5. Pr., junior standing. Analysis of education giving emphasis to the act of teaching both in theory and practice. Regardless of disciplinary emphasis, the concerns of educational purpose, curriculum and pedagogy will be the focus of the courses. Students will select one of the following disciplinary options: (a) philosophy of education, (b) history of education, (c) social foundations of education, (d) comparative education. Enrollment limited to education majors.

370. **INTRODUCTION TO STATISTICAL ANALYSIS IN THE HUMAN SCIENCES (3).** LEC. 3. Pr., MH 140 or MH 160. The fundamentals of research design and analysis in nursing, education and related human sciences. Practical experience in the application of the binomial, normal curve, Poisson and Chi-square distribution functions in research design. Required in Professional Nursing Curriculum. Non nursing students must have COI.
400. **MEASUREMENT AND EVALUATION IN EDUCATION (5).** LEC. 4, LAB. 2. Pr., FED 300 or equivalent and junior standing. Measurement and evaluation as an integral part of the teaching-learning process. Focus is on (a) identifying and defining intended learning outcomes, (b) constructing or selecting tests and other evaluation instruments that are relevant to specified outcomes, and (c) interpreting and using results in determining attainment of educational goals and improving learning and instruction. Enrollment limited to education majors.
446. **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
480. **PHILOSOPHICAL FOUNDATIONS OF EDUCATION (5).** Pr., FED 320 or equivalent. Educational movements and ideas in Western culture which influence modern educational practices. Evaluation of laboratory experiences and the Professional Internship through philosophical analysis of educational concepts and problems.

ADVANCED UNDERGRADUATE AND GRADUATE

515. **FOUNDATIONS OF CLASSROOM MANAGEMENT (4).** Focus on analysis and comparison of various theories of classroom management and their applications to the classroom situation.
520. **EDUCATIONAL SOCIOLOGY (5).** Pr., SY 201 or equivalent. The school as a social institution. Group interaction, formal and informal structure and organization, and the relationship of education to other social institutions.
534. **PERSONALITY DYNAMICS AND EFFECTIVE BEHAVIOR (5).** Pr., ten hours of psychology. Analysis of adaptive and maladaptive behavior. Not open to students majoring in psychology.

GRADUATE

600. **EDUCATION IN MODERN SOCIETY (5).** Pr., graduate standing. The interaction of historical, philosophical and sociological considerations affecting education in modern society.
601. **SOCIAL FOUNDATIONS OF EDUCATION (5).** Pr., graduate standing. Man as a social being, his social relationships and inventions, and value patterns. Directions and support of educational developments in relation to various socio-economic structures.
602. **SOCIAL CHANGE AND EDUCATIONAL DEVELOPMENT (5).** Pr., graduate standing. Major current theories of social change and their practical application in improving the school and directing social innovations which sustain educational improvements.
603. **SOCIAL AND CULTURAL DIVERSITY AND AMERICAN EDUCATION (5).** An investigation of the educational responses to social and cultural pluralism in contemporary American society.
605. **URBANIZATION AND EDUCATIONAL DEVELOPMENT (5).** Developments in the concentration of population, wealth, and cultural dissemination in urban areas. The changing character of this concentration, and its impact on educational agencies regarding different population groups and different areas of educational service.
610. **MEASUREMENT AND EVALUATION OF THE INDIVIDUAL IN EDUCATION (5).** Pr., FED 400 or COI. An in-depth study of the principles and techniques of measurement and evaluation which are applicable to educational settings. Emphasis will be given to both the theoretical and the practical. Special problems and issues will also be examined.
617. **ADVANCED EDUCATIONAL PSYCHOLOGY (5).** Major psychological theories and research which have direct implication for educational practice. Key topics include learning, the learner, individual differences, motivation, discipline, measurement and evaluation with emphasis on the practical as well as the theoretical.
618. **IMPLICATIONS OF LEARNING THEORY FOR EDUCATION (4).** Pr., FED 300 or equivalent. Theories of learning including the appropriate aspects of acquisition, transfer, motivation, and retention with comparative analysis of theories and educational implications.
619. **EDUCATIONAL IMPLICATIONS OF HUMAN DEVELOPMENT (4).** Pr., FED 300 or equivalent. A critical study of major concepts of human growth and development.
634. **HISTORY OF EDUCATION (5).** The emergence of education as a formal institution, tracing its historical development from early Greek times to the present and emphasizing the historical antecedents which have helped to shape the role and functions of education in Western culture.
636. **PHILOSOPHY OF EDUCATION IN AMERICA (5).** Major American contributions to the philosophy of education and their influence on educational practice. Need for, and procedures in, reexamining concepts in the light of recent scientific and cultural developments.
637. **DEVELOPMENT AND STATUS OF EDUCATIONAL PHILOSOPHY (5).** Pr., FED 636 or consent of department head. Development of philosophy of education from the standpoint of its implications for educational practice. Several patterns of thought are considered including supernaturalism, idealism, realism, humanism, communism, existentialism, and experimentalism.
639. **COMPARATIVE EDUCATION (5).** Pr., two quarters of graduate study or consent of department head. Comparative study of selected educational systems in nations in various stages of development. Special attention given to American educational issues in cross cultural contexts.

645. **CURRENT PROBLEMS AND ISSUES IN THE FOUNDATIONS OF EDUCATION (5).** Pr., teaching experience. Selected issues in the sociological, psychological, historical and philosophical foundations of education which affect the total educational enterprise and its relation to society.
646. **DIRECTED INDEPENDENT STUDY (1-6).** Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student at regular intervals.
647. **FOUNDATIONS IN CURRICULUM AND TEACHING (5).** Introduction to principles and processes related to curricular and instructional development, designs, and utilization. Emphasis on historical developments, problems in curricular organization and evaluation, forces affecting curriculum change, and current issues and significant research that contributes to the general knowledge of curriculum and instruction.
650. **SEMINAR IN FOUNDATIONS OF EDUCATION (3-10).** May be repeated for credit not to exceed 10 hours. Historical, philosophical, sociological, psychological, and research issues and their impact on education.
661. **RESEARCH AND EXPERIMENTATION IN EDUCATION (5).** Research methods, design of experiments, and evaluation; data sources, research planning, elements of scientific method and proposal writing. Current trends in educational research.
662. **NONPARAMETRIC STATISTICAL ANALYSIS (5).** Pr., FED 661. (Credit not allowed to meet minimum research requirements for doctoral students.) Common nonparametric statistical tests with special emphasis on nominal and ordinal data; estimation and multi-sample designs; emphasis on education applications and statistical models.
672. **STATISTICAL METHODS IN EDUCATION (5).** The need and importance of applying statistical methods to the study of educational problems, statistical methods appropriate to education, and interpretation of meanings of statistical analyses.
673. **RESEARCH AND EXPERIMENTAL DESIGN (5).** Pr., FED 672. Relationship of design to validity; significance of variables, testing hypotheses, evaluation of research and research findings.
675. **ADVANCED STATISTICAL METHODS IN EDUCATION (5).** Pr., FED 672. Analysis of variance and covariance; correlation analysis and linear regression. Simple and complex factorial designs applied to educational research.
676. **ADVANCED RESEARCH AND EXPERIMENTAL DESIGN (5).** Pr., FED 675. An extensive examination of the nature and character of experimental design in educational research including the development of appropriate analytical techniques.
680. **EDUCATIONAL PROGRAM AND CURRICULUM EVALUATION (5).** Pr., FED 610, 661, or COI. An intensive and critical study of various views of program and curriculum evaluation in education. Methods of evaluating programs will be examined, using available models and data gathering procedures.
682. **TECHNIQUES OF SCALE CONSTRUCTION (4).** Pr., FED 610 or PG 515 and FED 672 or COI. The rationale and development of instruments to assess attitudes will be presented and the analysis of data from questionnaires, surveys and other scale types will be considered. Students will be required to design and conduct a preliminary validation of an attitude scale.
685. **THEORY AND FUNCTION OF EDUCATIONAL MEASUREMENT (4).** Pr., FED 610, 673 or equivalents. Theory and statistical properties of test scores, classical test score theory and latent trait models will be presented. Emphasis will be on the conceptual as well as the technological application of test theory to education.
696. **GRADUATE RESEARCH FORUM (1).** Pr., FED 661. May be repeated but counted only once toward graduation. Presentations by graduate students of research proposals and/or findings. Analysis of procedures and findings.

Geography (GY)

Associate Professors Dawsey and Jeane
Assistant Professors Bagwell, *Acting Head*,
Dorman and Icenogle

102. **WORLD GEOGRAPHY (5).** Important characteristics of the land and people of the major regions of the world.
214. **PHYSICAL GEOGRAPHY (5).** Selected elements of the earth's physical system to include such items as land-forms, basic weather elements, soils, and vegetation.
215. **CULTURAL GEOGRAPHY (5).** Selected elements of cultural geography to include basic concepts, review of literature, and influence of man in changing the face of the earth.
300. **WEATHER AND CLIMATE (5).** Weather and climate: causes and controls. Characteristics and distribution of world climates and their economic and social effects. Not open to students having credit for GY 213.
302. **ECONOMIC GEOGRAPHY — COMMODITY PRODUCTION (5).** Distribution and environmental relationships of man's principal economic activities.
303. **THE SOVIET UNION — LAND AND PEOPLE (5).** Survey of the physical environment and cultural development of the region. Natural resources, economic activities, social patterns, political processes, problems, and prospects of the Soviet Union.
304. **LATIN AMERICA — LAND AND PEOPLE (5).** Survey of the physical environment and cultural development of the region. Natural resources, economic activities, social patterns, political processes, problems, and prospects of the major Latin American countries.

305. **THE UNITED STATES AND CANADA — LAND AND PEOPLE (5).** Survey of the region incorporating physical and cultural elements which provide a synthesis of the economic and political processes, developments and prospects for the United States and Canada.
306. **EUROPE — LAND AND PEOPLE (5).** Regional analysis of Europe from a systematic viewpoint, including among others the physical environment, population distribution, religion, politics and economics. Selected nations will be used for case studies within their regional setting and to illustrate Europe's global relationships.
307. **ASIA — LAND AND PEOPLE (5).** Four-part survey including SW Asia, South Asia, SE Asia and East Asia. The physical environment, economic base, population distribution and geopolitics will be used to illustrate the rising importance of this global region.
308. **AFRICA — LAND AND PEOPLE (5).** Survey of the physical and cultural geography of Africa with emphasis placed on the regions and countries of greater economic and international importance.
313. **COASTAL CLIMATOLOGY. (2 SM HRS., 3 QTR. HRS.)** An introduction to the physical factors which result in climatic conditions of coastal regions, with emphasis on the northern Gulf of Mexico. No prerequisites.
315. **ALABAMA — LAND AND PEOPLE (5).** Survey of the physical environment and cultural development of the state. Natural resources, economic activities, social patterns, problems, and prospects of the state in its regional setting will be covered.
350. **FRANCE — A GEOGRAPHIC PROFILE (5).** An intensive area study of France designed to produce a contemporary geographic profile based in the nation's history, physical resource base, social development and economy.
360. **LOCATION ANALYSIS (5).** Introduction to the location of economic activity. Analysis of the key variables and a survey of useful techniques for making locational choices.
399. **INDEPENDENT READINGS IN GEOGRAPHY (1-6).** May be repeated for a maximum of 6 hours credit. No more than 5 hours may be taken at one time. Course consists of directed readings and reports on topic approved by professor in charge.
400. **HISTORY OF GEOGRAPHIC THOUGHT (3).** The development of modern geographic thinking with special attention to the methodology employed in the science of geography.
401. **THE GEOGRAPHY OF INTERNATIONAL RELATIONS (5).** General elective. The interaction between the natural, physical environment and the international activities of world powers. Emphasis on the changing geographic and economic patterns in world affairs.
440. **CARTOGRAPHY (5).** Techniques of map construction, with attention given to both the drafting and interpretation of maps and other graphic presentations.

ADVANCED UNDERGRADUATE AND GRADUATE

504. **ADVANCED PHYSICAL GEOGRAPHY (5).** Pr., COI or GY 214. Geomorphological approach to the study of land-forms in addition to indepth analysis of earth systems.
505. **ADVANCED CULTURAL GEOGRAPHY (5).** Pr., COI or GY 215. Analysis of selected themes within the general field of cultural geography that illustrate man-land relationships.
507. **RESOURCES AND ENVIRONMENT (5).** An examination of the relationship between man and his physical environment emphasizing his use of natural resources and his impact on the land, sea, and atmosphere.
510. **ALABAMA — RESOURCES AND PROBLEMS (5).** Inventory and problematic aspects of Alabama resources, both human and natural. Students having credit for GY 315 will not be permitted to register for credit in GY 510.
520. **URBAN GEOGRAPHY (5).** The location, character, and growth of urban centers, with special attention to their interior patterns of land use and cultural development.

GRADUATE

600. **SEMINAR IN CULTURAL GEOGRAPHY (5).** Pr., COI, or graduate standing. Designed for intensive study and analysis of selected themes within the broad field of cultural geography.
650. **GEOGRAPHY SEMINAR (5-10).** Pr., COI or graduate standing. Designed for students in intensive study and analysis of problems in geography.

Geology (GL)

Professor Carrington

Associate Professors Cook, *Acting Head*, and Gastaldo

Assistant Professors Aadland, Bittner-Gaber, Burnell, Gardinier,

King, and Lewis

Instructor Chalokwu

101. **INTRODUCTORY GEOLOGY I (5). LEC. 4, LAB. 2.** All quarters. The origin and classification of rock-forming and ore minerals. Sedimentary, metamorphic, and igneous processes, and classification of rocks that result from such processes. Rock deformation and mountain building. Not open to students having credit in GL 110 or 315.

102. **INTRODUCTORY GEOLOGY II (5).** LEC. 4, LAB. 2. Pr., GL 101. All quarters. Geomorphology through study of weathering, mass movement, formation of soils, and the erosional, transportational, and depositional aspects of groundwater, streams, oceans, glaciers, and wind. Not open to students having credit in GL 110 or 315.
103. **HISTORICAL GEOLOGY (5).** LEC. 4, LAB. 2. Pr., GL 102 or 110. Physical and biological history of the earth, with emphasis on the evolution of life forms.
110. **PHYSICAL GEOLOGY (5).** LEC. 4, LAB. 2. All quarters. An accelerated course in general geology for the student with an interest and/or aptitude in natural sciences. Survey of the important minerals and rocks with emphasis on the processes that effect their formation and destruction. Origin and classification of geologic structures. Not open to students having credit in GL 101, GL 102 or 315.
205. **PALEOBOTANY (5).** LEC. 4, LAB. 2. Pr., BI 102, sophomore standing. Fall. Morphology, anatomy, evolution, and stratigraphy of fossil plants, including microscopic fossils.
206. **INVERTEBRATE PALEOZOOLOGY (5).** LEC. 4, LAB. 2. Pr., BI 103, sophomore standing. Winter. Morphology, classification, and significance of selected genera representative of the diversity of fossil invertebrates, including microscopic fossils.
215. **GEOLOGICAL FIELD METHODS (6).** LAB. 12. Pr., GL 110 or equiv., GL 240 and TS 102 or coreq. Summer. Instruments and methods used in geological field mapping. Final report required.
231. **INDEPENDENT GEOLOGICAL MAPPING (2).** LAB. 5. Pr., GL 215, sophomore standing. All quarters. Independent mapping project of limited extent done with the consent and under the direction of a faculty member. A geological map and report must be completed, summarizing the investigation of the area chosen.
240. **STRUCTURAL AND GEOTECTONIC PRINCIPLES (5).** LEC. 3, LAB. 4. Pr., GL 102, 110 or 315. Spring. Principles and processes of rock deformation, including description and classification of rock structures and methods of analysis. General history of the development of North America through understanding of plate structural developments.
301. **MINERALOGY (5).** LEC. 4, LAB. 2. Pr., CH 103, junior standing. Fall. Introduction to crystal chemistry and crystallography. Systematic study of representatives of important metallic and non-metallic mineral groups.
302. **OPTICAL MINERALOGY (5).** LEC. 4, LAB. 2. Pr., GL 301, junior standing. Winter. Theory and application of polarized light optics as applied to mineral identification, with emphasis on the study of rock-forming silicate minerals in thin sections.
305. **IGNEOUS AND METAMORPHIC PETROLOGY (5).** LEC. 4, LAB. 2. Pr., GL 302 and CH 105, junior standing. Spring. Principles and processes of intrusive and extrusive igneous activity and metamorphism. Description and classification of igneous and metamorphic rocks.
315. **ENGINEERING GEOLOGY (4).** LEC. 3, LAB. 2. Pr., junior standing. All quarters. Fundamental geological principles, materials and features that affect engineering projects and programs. Emphasis on pre-construction geological analysis in recognition of potential construction and post-construction hazards and problems. Not open to students having credit in GL 101, 102, or 110.
401. **SEDIMENTARY PETROLOGY (5).** LEC. 4, LAB. 2. Pr., GL 302 and CH 105, junior standing. Fall. Detailed description and classification of sedimentary rocks, with emphasis on the processes of sediment transportation, deposition and diagenesis in marine and non-marine environments.
411. **STRATIGRAPHY (5).** LEC. 4, LAB. 2. Pr., GL 205, 206, 240 and 401, junior standing. Winter. Descriptive geology pertaining to the discrimination, character, thickness, sequence, age, and correlation of rocks. Particular emphasis on field study of stratified rocks.
421. **ECONOMIC GEOLOGY (5).** LEC. 4, LAB. 2. Pr., GL 240, 305 and 401, junior standing. Spring. The origin, distribution and classification of mineral deposits formed by igneous, metamorphic and sedimentary (or secondary) processes. Introduction of methods of exploration and development.
431. **RESEARCH METHODS AND APPLICATION (1-4).** Pr., senior majoring in geology and/or consent of departmental faculty upon receipt of acceptable proposal. All quarters. Active participation in some phase of original research under supervision of a senior investigator. Credit evaluation determined by the departmental faculty on the basis of the formal presentation of the problem and the probable method(s) of investigation. May be taken more than one quarter for a maximum cumulative credit of four credit hours.

The following courses are available during Summer quarters at the Dauphin Island, Alabama, Sea Laboratory, and at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi. Application forms must be obtained from the Department of Geology during final registration for the Winter Quarter preceding intended attendance.

COURSES AT DAUPHIN ISLAND SEA LABORATORY

120. **MARINE TECHNICAL METHODS I (3).** LAB. 8. Summer only. Pr., COI. Introduction to instruments and procedures utilized aboard marine research vessels, including physical, biological and geological measurements and sampling techniques.
121. **MARINE TECHNICAL METHODS II (3).** LAB. 8. Summer only. Pr., COI. Introduction to laboratory methods associated with chemical parameters of "nutrient analysis." Shipboard and practical skills developed.
202. **INTRODUCTORY MARINE GEOLOGY (6).** LEC. 4, LAB. AND FIELD 4. Summer only. Pr., Physical Geology and COI. Sedimentary environments, seafloor topography and history of ocean basins. Sampling and laboratory techniques and relationship of biota to sediment substrate.

501. **RECENT MARINE SEDIMENTATION (6).** LEC. 4, LAB. 4. Summer only. Pr., GL 202 or ZY 201 or ZY 330 or COI. Properties of marine sediments, coastal environments, continental margins, reefs, and the deep sea. Monitoring and measuring of shoreline changes.
502. **PROBLEMS IN MARINE PALEOECOLOGY (6).** LEC. 4, LAB. 4. September Preterm, alternate years. Pr., GL 101-102 (or GL 110) and GL 206 or COI. Survey of principal Mesozoic and Cenozoic marine fossil groups, their paleoecology, and paleogeography.

COURSES AT GULF COAST RESEARCH LABORATORY

440. **PHYSICAL MARINE GEOLOGY (5).** LEC. 2, LAB. 5. Pr., consent of departmental adviser, junior standing. Summer only. General introduction to the physical processes resulting in the coastal morphology of Mississippi Sound, emphasizing erosional and depositional effects of waves and currents. Various environmental types (deltas, estuaries, etc.) and their characteristics are studied. Identification of ancient shorelines and ancient environments.
441. **CHEMICAL MARINE GEOLOGY (5).** LEC. 2, LAB. 5. Pr., consent of departmental adviser, junior standing. Summer only. Overview of the chemical systems in the oceans, with special emphasis on near-shore marine and estuarine environments. Basic analytical methods currently used to study the marine environment; with a strong concentration on instrumental methods of analyzing natural waters and sediments. Supervised research on chemical systems in the local estuaries, Mississippi Sound, and offshore.

ADVANCED UNDERGRADUATE AND GRADUATE

500. **PRINCIPLES OF GEOCHEMISTRY (5).** LEC. 3, LAB. 4. Pr., CH 105 or equiv. and MH 163. Fundamentals of chemical concepts as applied to geologic processes and solution of geologic problems. Survey of origin and distribution of elements in the solid earth. Laboratory emphasizes specific problems related to student's research and/or interests.
505. **PRINCIPLES OF ANALYTICAL GEOCHEMISTRY (3).** LEC. 2, LAB. 2. Pr., GL 302 or COI. Basic principles of x-ray diffraction/fluorescence and atomic absorption spectrophotometry will be discussed. Emphasis will be on their utilization in the analysis of geological materials.
510. **ADVANCED PALEOBOTANY (5).** LEC. 3, LAB. 4. Pr., GL 205 or COI. Taphonomic processes responsible for generation of plant bearing lithologies and hydrocarbon sources in deltaic and associated depositional environments. Laboratories will include examination of depositional sites within modern deltaic and barrier island systems, and carboniferous analogues in the southern Appalachian and Black Warrior Coal fields. Two 3-day field trips are required.
520. **MICROPALAEONTOLOGY (5).** LEC. 3, LAB. 4. Pr., BI 103, GL 103 or COI. Morphology, classification and biostratigraphic use of specific microfossil groups, including foraminifera, ostracodes and conodonts. Laboratory emphasis on collection, preparation and systematics of microfossils.
530. **COAL TECHNOLOGY (5).** LEC. 4, LAB. 2. Pr., GL 110 or COI. Introduction to origin, occurrence, exploration, development and beneficiation of coal. Emphasis on coal petrology as applied to rank, maceral and utilization parameters.
540. **PRINCIPLES OF EARTH SCIENCE (5).** LEC. 3, LAB. 4. Summer only. A special course in earth science for in-service and future teachers only. The subject matter encompasses internal surficial geology, meteorology, and oceanography. It stresses theory and applications and includes both indoor and field laboratories. Not open to undergraduates with credit in GL 101, 102, or 110. GL 540 is not a substitute for those courses.

GRADUATE

610. **ADVANCED STRUCTURAL GEOLOGY (4).** LEC. 3, LAB. 2. Pr., GL 240. Application of analytical techniques to microscopic, mesoscopic and megascopic deformational features of rocks. Lab emphasis on solution of local problems.
640. **SPECIAL TOPICS IN ECONOMIC GEOLOGY (4).** LEC. 3, LAB. 2. Pr., GL 421 or COI. The practical and theoretical aspects of economic geology as applied to exploration and development of natural resources, particularly fuels, base metals and precious metals. Emphasis on specific case histories, preparation of maps and reports, and the analysis of drill-recovered, geochemical and geophysical data.
650. **ADVANCED STRATIGRAPHY (4).** LEC. 3, LAB. 2. Pr., GL 411. In depth study of classical, paleontological, and/or physical stratigraphy. Emphasis on current research topics, techniques, and field work.
660. **IGNEOUS PETROLOGY (4).** LEC. 3, LAB. 2. Pr., GL 305. Classification of igneous rocks. Origin, composition, and properties of magmas. Genesis of the major igneous rock associations. Petrochemistry.
661. **SEDIMENTOLOGY AND SEDIMENTARY PETROLOGY (5).** LEC. 4, LAB. 2. Pr., GL 401 (or 501) and 411. Selected readings, lectures, and group discussion of significant papers on processes of sedimentation and diagenesis. Emphasis on interpreting depositional and post-depositional history of specific rocks. Analytical techniques and microscopic analysis of evaporites, carbonates, and clastics.
662. **METAMORPHIC PETROLOGY (4).** LEC. 3, LAB. 2. Pr., GL 305. Metamorphic zones, facies and reactions. Applications of experimental data to metamorphic rock genesis. Studies of selected metamorphic rocks in the southern Piedmont.
670. **SEMINAR I — SOUTHEASTERN GEOLOGY (1).** Fall. Reports and discussion covering general topics of regional geologic interest as well as specific geologic problems unique to the southeastern U.S. Emphasis on geologic history, economic, structural and stratigraphic topics.
671. **SEMINAR II — APPLIED GEOPHYSICAL METHODS (1).** Winter. Reports and discussion on the theory and uses of seismic, magnetic and electrical exploration techniques.

672. **SEMINAR III — GEOTECTONICS (1).** Spring. Reports and discussion on the principles, patterns and classification of tectonic phenomena.
680. **A,B,C,D,E,F,G. DIRECTED STUDIES (1-5).** Pr., COI. All quarters. Non-thesis credit research in areas not currently offered as, or to supplement, lecture courses. Requires written final report. May be taken more than one quarter for a maximum cumulative credit of four credit hours. A. Economic Geology — Coal Technology. B. Geophysics. C. Igneous, Metamorphic Petrology — Geochemistry. D. Paleontology. E. Sedimentary Petrology — Stratigraphy. F. Structural Geology — Geotectonics. G. Urban and Environmental Geology.
699. **THESIS (3).** All quarters. Pr., acceptance of thesis research proposal. May be taken more than one quarter.

Health Administration (HA)

(Department of Political Science)
Assistant Professors Burns and Smith

360. **INTRODUCTION TO HEALTH ADMINISTRATION (5).** Introduction to basic concepts and principles of administration of health services organizations.
370. **HEALTH ADMINISTRATION AND COMMUNITY (3).** Use of epidemiological methods in analysis of community resources, resource allocation, program implementation and general health administration. Development of appropriate strategies for effective community relations by health administrators.
420. **HEALTH POLICY (5).** Political issues affecting health services.
421. **LEGAL STRUCTURE OF HEALTH ADMINISTRATION (3).** Legal processes and aspects affecting the work of administrators of hospitals and other health services organizations.
450. **INTERNSHIP (10).** Pr., HSA or HSM major and junior standing. (S-U grading only). Practical administrative experience in health services organizations as arranged and approved by the HA Program.
451. **INTERNSHIP READING COURSE (5).** Coreq., concurrent enrollment in HA 450. Independent readings in administration of health services organizations as approved by instructor.
510. **HEALTH ADMINISTRATION (3).** Pr., PO 325 and HA 360, or COI. Human resources and material factors affecting administration of health services organizations.
530. **HEALTH ADMINISTRATION AND REGULATION (3).** Pr., HA 360 or COI. Government regulatory programs affecting administration of health services organizations.
531. **HEALTH ADMINISTRATION AND TECHNOLOGY (3).** Pr., HA 360 or COI. Effects of developments in modern technology on administration of health services organizations.
539. **TOPICS IN HEALTH ADMINISTRATION (1-5).** Pr., HA 360 or COI. Analysis of specific problems in health administration. May be repeated for a maximum of 10 hours credit.
550. **SPECIAL PROBLEMS IN HEALTH ADMINISTRATION (1-5).** Pr., COI. Qualified students conduct systematic investigation of selected problems in administration of health services under supervision of instructor.

Health, Physical Education and Recreation (HPR)

Professors Wilson, Head, Means, Moore, and Puckett
Associate Professors Davenport, Dragoin, Ford, Reeve, and Stone
Assistant Professors Bengtson, Blessing, Cherellia, Daniels, Lander,
Newkirk, Rosen, Tucker, Waldrop, and Washington
Instructors Drummond, Kepner, and Ricks

The instructional programs of the Department of Health, Physical Education and Recreation comprise (1) general program courses (PE); (2) health education courses (HED); (3) physical education courses (PED); and (4) recreation administration courses (RA). Teaching certification programs are offered in health education and physical education. Non-teaching programs are offered in community health education, human movement studies, and recreation administration.

PHYSICAL EDUCATION-GENERAL PROGRAM (PE)

Health Classification. A health status form provided by the department must be signed by each student prior to participation in a physical education course involving physical activity.

Physical Education Requirements: Refer to School or program requirements.

Credit. All 100- and 200- level PE courses carry two hours credit per quarter and 300-level courses carry one hour credit. (Maximum of six quarter hours allowed on degree.) No student may receive credit for a course in which the person has previously earned credit.

Students may not register for a beginning level course after having earned credit in the sport or dance area on an advanced level. Credit cannot be earned for a 200- and a 300-level course in the same sport.

To audit, students must secure approval of department head or director of physical education general program.

PHYSICAL EDUCATION SERVICE COURSES (PE)

101. **PHYSICAL FITNESS; SELF APPRAISAL (2).** Understanding of the relationship of human movement to body efficiency, aesthetics and health; self-appraisal; development of a personal plan for achieving and maintaining physical condition; selection of a personal program of developmental and recreational activities.
102. **SWIMMING FOR THE NON-SWIMMER (2).** Knowledge and skill in aquatics which are developed to a level sufficient to support a recreational interest and to assure one's own safety and the safety of others in and around water.
103. **INDIVIDUALIZED AQUATICS (2).** Provides water therapy, an understanding of adaptive movements, and aquatic skills.
104. **MOUNTAINEERING (2).** Pr., signed Army form 131. Basic climbing techniques and rappelling. Class presentations covering ropes, knots, snap links, and all associated equipment for climbers. Includes both discussion and practical exercises. Requires a weekend field training exercise with climbing and rappelling at Talladega National Forest.
105. **PISTOL MARKSMANSHIP (2).** Pr., signed Army form 131. Basic instruction and pistol firing exercises covering various shooting positions. Instruction is designed to expose the student to marksmanship as a challenging recreational sport.
107. **SPORTS AND DANCE IN AMERICAN CULTURE (2).** (ATYPICAL).
114. **SPECIAL FITNESS RELATED TOPIC (2).** Additional fee may be charged by cooperating agency.
115. **ADAPTED PHYSICAL EDUCATION (2).** Concerned with the improvement and correction of physiological and anatomical remedial defects.
116. **WEIGHT CONTROL (2).** Caloric intake-output, nutrition, and the development of desirable exercise and nutritional habits. Activities selected according to individual needs and limitations. Open to students with health classifications. "A" and "B."
117. **AEROBIC DANCE (2).**
125. **BASKETBALL (2).**
127. **SOCCER-SPEEDBALL (2).**
130. **JOGGING (2).**
131. **FENCING (2).**
132. **WRESTLING (2).**
133. **ORIENTEERING (2).** Pr., signed Army form 131. Instruction and practical application in land navigation and orienteering to include types of maps, use of lensatic and Silva compasses, determination of scale, distance, elevation and relief, map and ground orientation, field expedients for navigation, and a working knowledge of the different types of orienteering events. This course includes five hours of practical field work.
134. **JUDO (2).**
135. **WEIGHT TRAINING (2).**
136. **TRACK (2).**
137. **HANDBALL (2).**
138. **RACQUETBALL (2).**
139. **WILDERNESS SKILLS (2).** Pr., signed Army form 131. A personal confidence building course that provides an introduction to basic survival skills to include rappelling, food procurement and preparation, traps and snares, climbing techniques, hasty shelters, emergency first aid, and field expedient techniques. Course requires one weekend field trip to the Talladega National Forest.
140. **GYMNASTICS (2).** Understanding of gymnastics and skill in the use of different apparatus.
141. **TRAMPOLINE (2).**
142. **TUMBLING (2).**
144. **MODERN DANCE (2).** An understanding of dance as an art form.
145. **MODERN DANCE II (2).** Pr., PE 144 or equivalent.
146. **TAP DANCE (2).**
147. **BALLET (2).** Fundamentals and terminology of classical ballet.
148. **BALLET II (2).** Pr., PE 147 or equivalent.
149. **JAZZ DANCE (2).** Pr., COI.

150. **INTERMEDIATE SWIMMING (2).** Pr., COI.
151. **SPECIAL RECREATIONAL TOPIC (2).** Additional fee may be charged by cooperating agency.
152. **SWIMMING FOR FITNESS (2).** Pr., PE 150 or equivalent. Physical conditioning through water exercises and swimming.
153. **SPRINGBOARD DIVING (2).** Pr., COI. Instruction in the basic dives; front, back, inward, reverse, and twist.
154. **RECREATIONAL SPORTS AND ACTIVITIES (2).** Survey of selected recreational pursuits such as billiards, croquet, darts, gym bowling, hiking, horseshoes, net games, and shuffleboard.
155. **ANGLING (2).** Skills in bait and fly casting. Selection and care of tackle.
156. **ARCHERY (2).**
157. **BADMINTON (2).**
158. **BOWLING (2).** Additional fee payable to cooperating agency.
159. **GOLF (2).** Additional fee payable to cooperating agency.
162. **RIFLE MARKSMANSHIP (2).** Pr., signed Army form 131.
163. **TENNIS (2).**
165. **CAMPING (2).** Understanding of American heritage in relation to the out-of-doors, camping trends, conservation, and the development of camping skills.
166. **FAMILY RECREATION (2).** Leisure time activities suitable for the family.
168. **BASIC EQUITATION (2).** Additional fee payable to cooperating agency.
170. **FOLK DANCE (2).**
172. **SOCIAL DANCE (2).** Mixers, as well as ballroom dances: foxtrot, waltz, rhumba, tango, and other representative Latin dances.
180. **SOFTBALL (2).**
181. **VOLLEYBALL (2).**
201. **ADVANCED SURVIVAL AND MOUNTAINEERING (2).** Pr., signed Army form 131, Pr., PE 139 or PE 104 or equivalent. Topics include emergency first aid, food procurement and preparation, advanced rappelling and climbing, shelters, water sources, and field expedient techniques. Course requires a weekend field training exercise in the Talledega National Forest.
230. **LIFE SAVING (2).** Pr., COI. Skills leading to certification in Red Cross Senior Life Saving.
231. **SKIN DIVING (2).** Pr., COI. Underwater swimming includes selection and use of swim fins, mask, snorkel. Underwater physiology and safety are emphasized.
234. **JUDO II (2).** Pr., PE 134 or equivalent.
235. **WEIGHT TRAINING II (2).** Pr., PE 135 or equivalent.
238. **RACQUETBALL II (2).** Pr., PE 138 or equivalent.
250. **SYNCHRONIZED SWIMMING (2).** Pr., COI.
259. **GOLF II (2).** Pr., PE 159 or equivalent. Additional fee payable to cooperating agency.
263. **TENNIS II (2).** Pr., PE 163 or equivalent.

Varsity (PE)

325. **VARSITY BASKETBALL (1).**
326. **VARSITY FOOTBALL (1).**
332. **VARSITY WRESTLING (1).**
336. **VARSITY TRACK (1).**
337. **VARSITY CROSS COUNTRY (1).**
340. **VARSITY GYMNASTICS (1).**
350. **VARSITY SWIMMING (1).**
359. **VARSITY GOLF (1).**
362. **VARSITY RIFLERY (1).** Pr., signed Army form 131.
363. **VARSITY TENNIS (1).**
379. **VARSITY SOFTBALL (1).**
380. **VARSITY BASEBALL (1).**
381. **VARSITY VOLLEYBALL (1).**

HEALTH EDUCATION (HED)

102. **ORIENTATION FOR TRANSFER STUDENTS (1).**
195. **HEALTH SCIENCE (2).** Basic understanding concerning sound health practices and protection. Physical, mental, and social aspects of personal and community health are considered.
295. **SCHOOL HEALTH (3).**
296. **COMMUNITY HEALTH (3).**
394. **ELEMENTARY SCHOOL HEALTH INSTRUCTION (3). LEC. 2, LAB. 2.**
395. **SECONDARY SCHOOL HEALTH INSTRUCTION (3). LEC. 2, LAB. 2.**
396. **DRUG USE AND ABUSE (3).** Investigation of stimulants and depressants with special emphasis on alcohol, narcotics, and tobacco. The effects of these substances on the human body and the social, economic, and community problems associated with their use.
414. **TEACHING IN HEALTH EDUCATION (3). LEC. 2, LAB. 2.** Pr., admission to Teacher Education for certification program.
423. **PROGRAM IN HEALTH EDUCATION (3). LEC. 2, LAB. 2.** Pr., admission to Teacher Education for certification program.
425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing. Professional screening of appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the experience.
446. **DIRECTED INDEPENDENT STUDY (1-10).** Student's learning efforts are guided toward desired goals. Includes evaluation by professor and student of work accomplished at regular intervals.
450. **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts.
494. **EMERGENCY CARE AND FIRST AID (3). LEC. 2, LAB. 2.** (Same as PED 494.)
495. **PRACTICUM (1-10).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

ADVANCED UNDERGRADUATE AND GRADUATE (HED)

509. **ADVANCED HEALTH SCIENCE (5).** Pr., COI. Principles and concepts basic to the improvement of individual and group living and the role of the home, school, and community in the development of sound physical and mental health.
519. **CURRENT PROBLEMS IN HEALTH EDUCATION. (5).** Pr., COI.
592. **CONSUMER HEALTH EDUCATION (5).** Pr., basic health science course or COI. Principles related to the selection and use of health products and services and the evaluation of health information.
594. **TEACHING SEX EDUCATION (5).** Pr., PG 444 or equivalent. Basic concepts, current research, resources, and teaching strategies related to human sexuality and education.
597. **DRUG ABUSE EDUCATION (5).** Pr., COI. Practical and working understanding of drugs and drug abuse problems to prospective and in-service teachers, counselors, administrators, pharmacists, law enforcement personnel, nurses and others.

GRADUATE (HED)

625. **INTERNSHIP IN HEALTH EDUCATION (1-15).**
646. **DIRECTED INDEPENDENT STUDY (1-6).** Student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
650. **SEMINAR IN HEALTH EDUCATION (1-10).** Pr., graduate standing. Advanced graduate students and professors pursue cooperatively selected concepts and theoretical formulations.
- 651.* **RESEARCH STUDIES IN HEALTH EDUCATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet changing needs.
- 652.* **CURRICULUM AND TEACHING IN HEALTH EDUCATION (5).** Teaching practices and appraisal of selecting experiences and content for curriculum improvement.
- 653.* **ORGANIZATION OF PROGRAM IN HEALTH EDUCATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
- 654.* **EVALUATION OF PROGRAMS IN HEALTH EDUCATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
691. **PERSPECTIVES ON HEALTH EDUCATION (5).** Pr., basic health science course or COI. Developments in school and public health, medicine, and related health sciences in relation to modern health education programs and practices.
693. **WORLD HEALTH PROBLEMS (5).** Pr., basic course in health science, SY 201, EC 200, or COI. Health practices, beliefs, and programs in selected countries and cultures.

- 695. **PRACTICUM.** (1-15). Experiences closely relating theory and practice, usually carried on simultaneously.
- 696. **GRADUATE RESEARCH FORUM** (1). Required of all graduate students in health education. May be repeated but counted only once toward graduation. Presentations by graduate student of proposals and/or findings. Analysis of procedures and findings.
- 699. **RESEARCH AND THESIS.** (CREDIT TO BE ARRANGED.) May be taken more than one quarter.
- 798. **FIELD PROJECT.** (CREDIT TO BE ARRANGED.) May be taken more than one quarter.
- 799. **RESEARCH AND DISSERTATION.** (CREDIT TO BE ARRANGED.) May be taken more than one quarter.

PROFESSIONAL PHYSICAL EDUCATION (PED)

- 102. **ORIENTATION FOR TRANSFER STUDENTS** (1).
- 118. **SKILLS AND CONCEPTS OF INDIVIDUAL AND DUAL ACTIVITIES I** (3). LAB. 6. Track and Field, archery, golf, wrestling and other individual and dual activities.
- 119. **SKILLS AND CONCEPTS OF INDIVIDUAL AND DUAL ACTIVITIES II** (3). LAB. 6. Tennis, badminton, racquetball, squash and handball.
- 120. **SKILLS AND CONCEPTS OF GYMNASTICS** (4). LAB. 8. Tumbling, trampoline and apparatus.
- 121. **SKILLS AND CONCEPTS OF AQUATICS** (2). LAB. 8. Strokes, survival swimming techniques, competitive swimming, springboard diving, and other aquatic activities.
- 122. **SKILLS AND CONCEPTS OF TEAM SPORTS** (3). LAB. 6. Power volleyball, soccer, speedball, basketball, softball, field hockey and other team sports.
- 123. **SKILLS AND CONCEPTS OF DANCE** (4). Lab. 8. Contemporary, folk, square, tap and ethnic dance.
- 201. **HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION** (3).
- 202. **BASKETBALL** (3). LEC. 2, LAB. 2. Fundamental skill techniques of basketball — offense, defense, and strategy.
- 203. **BASEBALL** (3). LEC. 2, LAB. 2. Offensive and defensive strategy, pitching, catching, infielding, outfielding, batting and baserunning.
- 204. **TRACK AND FIELD** (3). LEC. 2, LAB. 2. Fundamental skills and techniques of track and field athletics. The organizing and conducting of track meets.
- 206. **FOOTBALL** (3). LEC. 2, LAB. 2. Fundamentals of football and the different types of offense, defensive team strategy and generalship.
- 207. **THEORY AND CONDUCT OF DANCE PROGRAMS** (3). LEC. 2, LAB. 2. Pr., PED 123.
- 208. **THEORY AND CONDUCT OF TEAM SPORTS** (3). LEC. 2, LAB. 2.
- 209. **THEORY AND CONDUCT OF INDIVIDUAL AND DUAL SPORTS** (3). LEC. 2, LAB. 2.
- 210. **THEORY AND CONDUCT OF GYMNASTICS** (3). LEC. 2, LAB. 2.
- 211. **SENSORIMOTOR ACTIVITIES** (3). LEC. 2, LAB. 2. Designed to develop understandings and skills concerning the broad concept of sensorimotor experiences for children, ages 4-8.
- 212. **ELEMENTARY SCHOOL ACTIVITIES** (3). LEC. 2, LAB. 2. Physical education activities suitable for the first six grades including teaching devices.
- 213. **DANCE FOR CHILDREN** (3). LEC. 2, LAB. 2. Includes all forms of dance suitable for elementary school age children with emphasis on creative dance activities which afford a progression in dance skills.
- 224. **FOOTBALL OFFICIATING** (1). LAB. 3.
- 225. **BASKETBALL OFFICIATING** (1). LAB. 3.
- 226. **SOFTBALL OFFICIATING** (1). LAB. 3.
- 227. **VOLLEYBALL OFFICIATING** (1). LAB. 3.
- 315. **KINESIOLOGY** (4). LEC. 3, LAB. 2. Pr., ZY 250-251.
- 351. **WATER SAFETY** (3). LEC. 1, LAB. 4. Pr., current Red Cross Sr. Life Saving Certificate. American Red Cross Advanced Swimmer and Water Safety Instructor courses leading to certification. (Same course as RA 351.)
- 370. **DANCE SURVEY** (3). LEC. 2, LAB. 2. Comprehensive study of dance from primitive man to current styles of dance.
- 372. **DANCE PRODUCTION** (3). LEC. 2, LAB. 2. Apprenticeship in producing dance programs, exhibitions of physical activity and festivals.
- 373. **DANCE THEATRE** (1-6). Pr., COI. Participation in rehearsal lecture demonstrations, concert work and other presentations related to dance.
- 404. **ATHLETIC INJURIES** (3).
- 405. **PHYSIOLOGY OF EXERCISE** (4). LEC. 3, LAB. 2. Pr., ZY 250-251. Principles of physiology with special emphasis on the application of physiological findings to practical problems related to human physical activity.

414. **TEACHING IN PHYSICAL EDUCATION IN ELEMENTARY AND SECONDARY SCHOOLS (3).** LEC. 2, LAB. 2. Pr., FED 320 or equivalent. Admission to Teacher Education.
416. **ADAPTIVE PHYSICAL EDUCATION (3).** LEC. 2, LAB. 2. Pr., ZY 250, RSE 561, or COI. Review of anatomy, physiology, and psychology pertaining to special programs of physical education for the temporarily and permanently handicapped, with laboratory practice in posture training and remedial gymnastics.
423. **PROGRAM IN PHYSICAL EDUCATION (5).** Pr., admission to Teacher Education for certification program.
424. **INTRAMURALS AND OFFICIATING (3).** LEC. 2, LAB. 2.
425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, professional screening, appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.
426. **EVALUATION AND MEASUREMENT IN PHYSICAL EDUCATION (3).** LEC. 2, LAB. 2. Pr., FED 400.
429. **MOTOR LEARNING AND PERFORMANCE (4).** LEC. 3, LAB. 2. Pr., PG 211. Process of motor skill acquisitions; emphasis on variables that influence motor learning and performance.
446. **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
450. **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations normally in small groups.
494. **EMERGENCY CARE AND FIRST AID (3).** LEC. 2, LAB. 2. (Same course as HED 494)
495. **PRACTICUM (1-10).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

ADVANCED UNDERGRADUATE AND GRADUATE (PED)

517. **PHYSICAL EDUCATION FOR THE MENTALLY RETARDED (3).** LEC. 2, LAB. 2. Pr., PED 211 or 212. The motor characteristics of the mentally retarded and the design of special programs of physical education; involves working with mentally retarded children.
520. **SOCIOLOGY OF SPORT (5).** Sport and culture. Attention is given to social processes and human behavior in sport situations.
527. **DANCE CONCEPTS AND RELATED CLASSROOM EXPERIENCES (5).**

GRADUATE (PED)

601. **HISTORY OF SPORT AND PHYSICAL EDUCATION (5).** Historical backgrounds of sport and physical education with emphasis on the development of significant trends and the contributions of specific individuals.
615. **BIOMECHANICS OF SPORT (5).** In-depth investigation of the mechanical and musculoskeletal factors that affect human performance in sport activities; methods of cinematographic, electromyographic and electronic assessment of human motor skills with emphasis on determination of effective and efficient movement patterns.
616. **BIOMECHANICS OF SPORT INJURY (5).** Analysis of musculoskeletal factors, pathomechanics, and tissue properties that define the tolerance of the human body to the forces and torques developed in sport activities. Techniques for prevention of injury and design of protective equipment based on such information are explored.
619. **SCIENTIFIC PRINCIPLES APPLIED TO PHYSICAL EDUCATION AND ATHLETICS (5).** Pr., undergraduate major or minor in health and physical education. Specific application of physics, physiology, and psychology to the development of physical skills and related topics including reaction time, motivation, maturation, illusions, morale, and problems of group social living in physical education and athletics.
625. **INTERNSHIP (5-15).** Supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences accompanied by regularly scheduled, on-campus discussion periods and evaluation and analysis of the intern experience.
626. **PHYSICAL FITNESS A CRITICAL ANALYSIS (5).** Pr., ZY 250-251 or consent of department head. Critical analysis of physical fitness objectives of physical education through inquiry into current research in medicine, physiology of muscular activity, and physical fitness appraisal and guidance.
629. **PSYCHOMOTOR FOUNDATIONS OF PHYSICAL ACTIVITY (5).** Pr., PED 429 or COI. Overview of the relationships between psychological factors and motor performance; methods of research in the areas of motor development, motor learning, and sport psychology; reviewing experimental studies, and current issues of psychomotor research.
630. **THEORETICAL BASES OF MOTOR LEARNING AND MOTOR CONTROL (4).** LEC. 3, LAB. 2. Pr., PED 629 or equivalent. Contemporary theories of motor learning and motor control; critical review and analysis of research related to models of motor performance; laboratory experiences that demonstrate current theoretical issues of motor learning and control.
635. **PSYCHOSOCIAL DIMENSIONS OF SPORT (5).** Pr., PED 629 or equivalent. Psychological variables related to participation in sports; personality, motivation, and aggression as related to competition in athletic events.
646. **DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.

650. **SEMINAR IN PHYSICAL EDUCATION (1-10).** Pr., graduate standing. Opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.
- *651. **RESEARCH STUDIES IN PHYSICAL EDUCATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
- *652. **CURRICULUM AND TEACHING IN PHYSICAL EDUCATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvements.
- *653. **ORGANIZATION OF PROGRAM IN PHYSICAL EDUCATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
- *654. **EVALUATION OF PROGRAM IN PHYSICAL EDUCATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
655. **MOVEMENT EDUCATION (5).** Developing a theoretical understanding of perceptual motor development and movement education, and in exploring the interdisciplinary implications of movement education for child development and the teaching-learning process.
657. **ADMINISTRATION OF ATHLETICS (5).** Pr., PED 423 or equivalent. Standards and procedures associated with the administration of school and college athletics. Includes relationships with state and national athletic organizations.
658. **FACILITIES AND EQUIPMENT IN PHYSICAL EDUCATION AND ATHLETICS (5).** Pr., PED 653 or 657 or COI. Planning and management of budgets, facilities, and equipment for physical education and athletic programs.
662. **PHYSICAL DIMENSIONS OF COUNSELING (5).** Pr., CED 621 or 622. The physical aspects of the helping relationship; implementation of physical fitness skills to raise the energy level of the helper; use of physical fitness and challenge response activities as a tool in the helping relationship. (This course is also offered as CED 662.)
669. **ADVANCED PHYSIOLOGY OF EXERCISE (5).** Pr., PED 405 or equivalent. Physiological aspects of fatigue, training, and physical fitness with special emphasis on the integration of organ systems in adapting to requirements of muscular exercise.
670. **NEUROMUSCULAR ASPECTS OF EXERCISE AND TRAINING (5).** Pr., PED 669 or COI. Effects of various methods of exercise and training on nerve and muscle cell structure and function. Neuromuscular integration in exercise.
695. **PRACTICUM (1-15).** Experiences closely relating theory and practice, usually carried on simultaneously.
696. **GRADUATE RESEARCH FORUM (1).** Required of all graduate students in health education and physical education. May be repeated but counted only once toward graduation. Presentations by graduate students of proposals and/or findings. Analysis of procedures and findings.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
796. **FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

RECREATION ADMINISTRATION (RA)

102. **ORIENTATION (1).** Orientation for majors.
282. **PRINCIPLES OF RECREATION (3).** The significance and meaning of leisure; theories of play; the recreation movement in the United States. Principles of program planning and development at state and local levels of government, in schools and in industry.
351. **WATER SAFETY (3).** LEC. 1, LAB. 4. Pr., current Red Cross Sr. Life Saving Certificate. American Red Cross Advanced Swimmer and Water Safety Instructor courses leading to certification. (Same course as PED 351.)
384. **PARK AND RECREATION MAINTENANCE (3).** Basic maintenance principles applicable to park and recreation agencies.
386. **RECREATION LEADERSHIP (3).** Theories and techniques of leadership applied to recreation settings.
387. **OUTDOOR RECREATION (3).** Those recreational activities which occur in an outdoor environment and which relate directly to that environment.
388. **CAMP MANAGEMENT (3).** Introduction to the principles and applications of organized camping.
389. **RECREATION INTERPRETATIVE SERVICES (3).** Pr., RA 282. Principles and techniques used to communicate natural, historical, and cultural features of an outdoor recreation area to park visitors. Develops the ability to gather information, create, and present an interpretative program.
423. **PROGRAM IN RECREATION ADMINISTRATION (5).** Pr., senior standing, HRA major only. The administrative functions required in recreation settings.

*Prerequisites for HED and PED 651, 652, 653, and 654 courses are 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, professional screening, appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.
446. **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
450. **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations normally in small groups.
485. **SOCIAL RECREATION (3).** The organizing, planning and implementing of social oriented activities in park and recreation settings.
486. **PARK PLANNING (3).** Pr., RA 282. Basic design principles as related to recreation and park planning. Consideration is given to design problems and solutions in park maintenance, vandalism, visitor control and other problems of recreation resource management.
487. **PARK MANAGEMENT (3).** Pr., RA 282. An investigation into the operation of parks and resource areas with emphasis on the managerial function of the park administrative personnel.
495. **PRACTICUM (1-10).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

ADVANCED UNDERGRADUATE AND GRADUATE (RA)

580. **SCHOOL-COMMUNITY RECREATION (5).** Analysis of recreation as it relates to the school and the community.

History (HY)

Professors Flynt, Head, Belser, Bond, Campbell, Harrison, Jones, Lewis,
Newton, Owsley, and Rea

Associate Professors Cronenberg, Fabel, Gerber, Kicklighter, Hall,
Henson, and Olliff

Assistant Professors Beckwith, Bohanan, Crocker, McFarland, Melancon, and Reed

101. **WORLD HISTORY (3).** A survey of world civilization from prehistory to 1400.
102. **WORLD HISTORY (3).** A survey of world civilization from 1400-1815.
103. **WORLD HISTORY (3).** A survey of world history from 1815 to the present.
171. **HONORS PROGRAM. ANCIENT AND MEDIEVAL HISTORY (3).** Pr., admission to Honors Program.
172. **HONORS PROGRAM. EARLY MODERN HISTORY (3).** Pr., admission to Honors Program.
173. **HONORS PROGRAM. MODERN HISTORY (3).** Pr., admission to Honors Program.
201. **A HISTORY OF THE UNITED STATES TO 1865 (5).**
202. **A HISTORY OF THE UNITED STATES SINCE 1865 (5).**
204. **TECHNOLOGY AND CIVILIZATION I (3).** The interaction of technology and of human culture from prehistoric times to the industrial revolution.
205. **TECHNOLOGY AND CIVILIZATION II (3).** The interaction of technology and of human culture from the industrial revolution to the end of the nineteenth century.
206. **TECHNOLOGY AND CIVILIZATION III (3).** The interaction of technology and other aspects of human culture in the twentieth century.
207. **EUROPEAN HISTORY, 1500-1815 (5).** A survey of early modern Europe through the French Revolution.
208. **EUROPEAN HISTORY SINCE 1815 (5).** A survey of Europe since the French Revolution.
274. **HONORS TECHNOLOGY AND CIVILIZATION I (3).** Pr., admission to Honors Program. Interaction of technology and human culture from historic times to the industrial revolution for selected honors students from scientific and engineering disciplines.
275. **HONORS TECHNOLOGY AND CIVILIZATION II (3).** Pr., admission to Honors Program. Interaction of technology and human culture from industrial revolution to the end of the 19th century for selected honors students from scientific and engineering disciplines.
276. **HONORS TECHNOLOGY AND CIVILIZATION III (3).** Pr., admission to Honors Program. Interaction of technology and culture in 20th century for selected honors students from scientific and engineering disciplines.
300. **INTRODUCTION TO LATIN AMERICA HISTORY (3).** Pr., sophomore standing. Latin American civilizations to the present with emphasis on the Colonial Period.
301. **INTRODUCTION TO FAR EASTERN HISTORY (5).** Pr., sophomore standing. The major cultural and institutional developments of the area.
306. **CONTEMPORARY HISTORY (3).** Recent events and their effect on the modern world.

307. **HISTORY OF U.S. AIR POWER (3).** Traces evolution of U.S. military aviation policy.
308. **NAVAL HISTORY OF THE UNITED STATES (3).** The United States Navy from the American Revolution to the present including the evolution of naval technology and strategy and the role of the navy in defense, discovery, and diplomacy.
309. **MILITARY HISTORY OF THE UNITED STATES (3).** History of the United States military policy, strategy, and tactics, 1775 to the present (land warfare).
310. **GRECO-ROMAN HISTORY (5).** Pr., sophomore standing. The Classical or Hellenic Civilization from the Homeric Age to the reign of the Emperor Justinian.
311. **MEDIEVAL HISTORY (5).** Pr., sophomore standing. Europe from the fall of the Roman Empire to the Age of Discovery.
315. **AMERICAN BLACK HISTORY (5).** Pr., sophomore standing. Survey of black history in America.
317. **AMERICAN FOLK/ORAL HISTORY (3).** A cultural survey of the "common people," utilizing oral history.
321. **U.S. LEGAL AND CONSTITUTIONAL HISTORY (3).** Describes changes in U.S. Constitution and legal system.
350. **HISTORY OF POLITICAL PARTIES (5).** Pr., sophomore standing. Origin and growth of American political parties from the Federalist era to the present.
354. **HISTORY OF THE MIDDLE EAST (3).** Surveys history and culture of region.
355. **HISTORY OF THE IBERIAN PENINSULA (5).** Spanish and Portuguese history, prehistoric to contemporary.
356. **MODERN FRANCE (5).** From the *Ancien Regime* to the present.
359. **WORLD WAR II (3).** Discusses origins and military campaigns of W.W. II.
380. **SCIENCE FICTION AS INTELLECTUAL HISTORY (5).** Pr., junior standing. The interaction between science, technology, and other aspects of human culture as dramatized in classic works of science fiction.
381. **HISTORY OF ALABAMA (5).** Pr., sophomore standing. A brief history of Alabama from the beginning to the present.
390. **SPECIAL TOPICS IN HISTORY (3).** Pr., junior standing. Topics vary. May be taken twice on different topics.
400. **HISTORY HONORS (5).** Consists of directed reading and writing on various topics. Can be repeated twice.

ADVANCED UNDERGRADUATE AND GRADUATE

500. **AMERICAN COLONIAL HISTORY (5).** The political, economic, and social history of the colonies from their founding to the end of the French and Indian War, 1763.
501. **THE AMERICAN REVOLUTION AND THE CONFEDERATION, 1763-1789 (5).** The new British Colonial policy, the War for independence, and the first federal constitution and the movement to replace it.
502. **FEDERALIST AND JEFFERSONIAN AMERICA, 1789-1815 (5).** The establishment of the new federal government, the origins of American political parties, and the role of the United States in the French Revolutionary and Napoleonic Wars.
503. **THE AMERICAN SYSTEM AND JACKSONIAN DEMOCRACY, 1815-1850 (5).** Nationalism, sectionalism, egalitarianism, and expansion.
504. **THE CIVIL WAR (5).** The sectional controversy from the Compromise of 1850 to the beginning of hostilities in 1861, and the military, economic, social, and political aspects of the war.
505. **THE RECONSTRUCTION PERIOD (5).** An analysis of the social, economic, and political aspects of the years 1865-1877.
506. **UNITED STATES HISTORY, 1877-1920 (5).** Development of the United States.
507. **RECENT UNITED STATES HISTORY, 1920 TO THE PRESENT (5).** Development of the United States.
509. **NINETEENTH-CENTURY U.S. DIPLOMACY (5).** U.S. relations with foreign powers during the 19th century.
510. **TWENTIETH-CENTURY U.S. DIPLOMACY (5).** Emergence of America as a world power.
511. **SOCIAL AND INTELLECTUAL HISTORY OF THE UNITED STATES TO 1876 (5).** Selected areas of American thought ranging from Puritanism to the impact of Darwinism on the American mind.
512. **SOCIAL AND INTELLECTUAL HISTORY OF THE UNITED STATES SINCE 1876 (5).** Major intellectual movements in American society from social Darwinism to Progressivism and its legacy.
513. **THE SOUTH TO 1865 (5).** The origins and growth of distinctive social, economic, cultural, and ideological patterns in the South with emphasis on period 1815-1860.
514. **THE SOUTH SINCE 1865 (5).** Major trends in the South since the Civil War with emphasis on social, economic, cultural, and ideological development.
516. **SOCIAL AND INTELLECTUAL HISTORY OF MODERN EUROPE (5).** Selected topics in social and intellectual history which have shaped modern European cultures.
526. **THE RENAISSANCE AND REFORMATION, 1400-1600 (5).** Europe during the Reformation and Renaissance.
527. **SEVENTEENTH-CENTURY EUROPE (5).** Emphasis on the Thirty Years' War, Scientific Revolution, overseas colonization, and European political developments in the age of Louis XIV.

528. **EUROPE, 1715-1789 (5).** A history of Europe from the Age of Absolutism to the collapse of the Old Regime.
529. **THE FRENCH REVOLUTION AND NAPOLEONIC EUROPE, 1789-1815 (5).** Causes and course of the Revolution in France, the Consulate, and the Empire, and French hegemony in Europe.
531. **HISTORY OF EUROPE, 1815-1871 (5).** European history from the Congress of Vienna through the unification of Germany and Italy.
532. **EUROPE, 1871-1919 (5).** Emphasis on Central Europe, Germany, and Italy since unification.
533. **EUROPE SINCE 1919 (5).** Emphasis on the rise of totalitarianism, the Second World War, and the post-war period.
537. **MODERN GERMAN HISTORY (5).** A general history of the German states since 1815.
550. **EASTERN ASIA (5).** A history of China and Japan in the modern world.
552. **THE CARIBBEAN AREA (5).** An analysis of the Caribbean as to its geographic, cultural, and strategic importance from 1492 to the present.
553. **SOUTH AMERICA TO 1900 (5).** The colonial and early national period.
554. **HISTORY OF MEXICO (5).** An analysis of the unique cultural development of Mexico.
555. **TWENTIETH-CENTURY SOUTH AMERICA (5).** A survey of the conflict between tradition and change in a developing continent.
556. **HISTORY OF MODERN RUSSIA, 1453-1917 (5).** A detailed history of the Russian nation in the modern era to the dissolution of the Empire.
557. **HISTORY OF THE SOVIET UNION SINCE 1917 (5).** Examines the Soviet Union from its revolutionary inception in 1917 to the present day.
571. **HISTORY OF MEDIEVAL ENGLAND (5).** A survey of English origins and institutions to the seventeenth century.
572. **HISTORY OF MODERN ENGLAND (5).** A survey of British history since the seventeenth century.
578. **TECHNOLOGY AND SOCIETY IN PRE-INDUSTRIAL TIMES (5).** The interplay between technology and human culture during selected periods of pre-industrial history.
579. **TECHNOLOGY AND SOCIETY IN THE INDUSTRIAL REVOLUTION (5).** Various approaches to the study of the interaction between technology, industry, and society in the United States and other countries during selected periods, normally in the late eighteenth and nineteenth centuries.

GRADUATE

600. **SEMINAR IN AMERICAN HISTORY, 1763-1800 (5).**
601. **SEMINAR IN AMERICAN HISTORY, 1800-1850 (5).**
602. **SEMINAR IN AMERICAN HISTORY, 1850-1876 (5).**
603. **SEMINAR IN AMERICAN HISTORY, 1876-1920 (5).**
604. **SEMINAR IN AMERICAN HISTORY: 1920 TO THE PRESENT (5).**
605. **NINETEENTH CENTURY U.S. DIPLOMACY (5).**
606. **TWENTIETH CENTURY U.S. DIPLOMACY (5).**
608. **AMERICAN SOCIAL AND INTELLECTUAL HISTORY (5).**
609. **SEMINAR IN THE OLD SOUTH (5).**
610. **SEMINAR IN THE NEW SOUTH (5).**
611. **SEMINAR IN BLACK HISTORY (5).**
629. **HISTORICAL METHODS (5).**
633. **SEMINAR IN SIXTEENTH-CENTURY EUROPE (5).**
634. **THE RUSSIAN REVOLUTION (5).** Pr., HY 556.
635. **SEMINAR IN MODERN EUROPEAN HISTORY (5).**
636. **COLONIAL LATIN AMERICA (5).**
637. **LATIN AMERICA IN THE NATIONAL PERIOD, REVOLUTIONARY MOVEMENTS, AND NATIONAL DEVELOPMENTS (5).**
638. **SEMINAR IN THE FRENCH REVOLUTIONARY AND NAPOLEONIC ERA (5).**
639. **HISTORIOGRAPHY AND THEORY OF HISTORY (5).** Fall, even-numbered years.
640. **TUDOR ENGLAND (5).** Alternate years.
641. **STUART ENGLAND (5).** Alternate years.
642. **EIGHTEENTH CENTURY ENGLAND (5).**

- 644. SEMINAR IN MODERN EUROPEAN DIPLOMACY (5).
- 650. ARCHIVAL INTERNSHIP (10). Pr., HY 628.
- 651. HISTORIC PRESERVATION INTERNSHIP (10). On site supervised internship. For students in Historic Preservation program only.
- 699. RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)
- 799. RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)

READING COURSES

The following reading courses are offered in order to give the graduate student an opportunity for study in specialized areas and are rigorously supervised by the professors responsible for the fields. Registration is by permission of the department and the major professor.

- 620. DIRECTED READING IN AMERICAN HISTORY TO 1876 (5).
- 621. DIRECTED READING IN AMERICAN HISTORY SINCE 1876 (5).
- 622. DIRECTED READING IN EUROPEAN HISTORY TO 1815 (5).
- 623. DIRECTED READING IN EUROPEAN HISTORY SINCE 1789 (5).
- 624. DIRECTED READING IN LATIN AMERICAN HISTORY (5).
- 625. DIRECTED READING IN FAR EASTERN HISTORY (5).
- 626. DIRECTED READING IN ENGLISH HISTORY (5).
- 628. DIRECTED READING AND STUDY IN ARCHIVAL PROCEDURES (5).

Horticulture (HF)

Professors Perkins, Head, Amling, Chambliss, Dozier, Norton, Rymal, and Sanderson
Associate Professors Gilliam, Perry, Ponder, and Smith
Assistant Professors Cox, and Keever
Adjunct Instructors Brown and Sistrunk

LANDSCAPE AND ORNAMENTAL HORTICULTURE

- 101. INTRODUCTION TO HORTICULTURE (3). LEC. 2, LEC-DEM. 2. Fall. An introduction to practical and scientific principles of horticulture. Primarily for new students majoring in horticulture and non-majors who want a general knowledge of the subject. General techniques of ornamental, fruit and vegetable gardening, and career opportunities in horticulture will be discussed.
- 221. LANDSCAPE GARDENING (5). LEC. 3, DEM. 4. Pr., BI 102. Principles of landscape gardening applied to the development of small home grounds and school grounds. The lecture-demonstration periods are devoted to the study of the identification and use of ornamental plants, landscape drawings, and the propagation and maintenance of ornamental plants.
- 222. TREES (5). LEC. 3, LAB. 4. Pr., HF 221 or COI. Identification, culture and use of ornamental trees in landscape plantings.
- 223. EVERGREEN SHRUBS AND VINES (5). LEC. 3, LAB. 4. Pr., HF 221 or COI. Identification, culture, and use of broadleaf and narrowleaf evergreens in landscape plantings.
- 224. PLANT PROPAGATION (5). LEC. 3, LAB. 4. Pr., BI 102. Basic principles and practices involved in the propagation of horticulture plants.
- 225. FLOWER ARRANGING (3). LEC. 2, LAB. 2. General elective. Principles and practices of flower arranging for the home.
- 226. LANDSCAPE GRAPHICS (3). LEC. 2, LAB. 3. The development of drawing and drafting skills used to evolve and communicate schematic and detail landscape design concepts.
- 321. DECIDUOUS SHRUBS AND VINES (5). LEC. 3, LAB. 4. Pr., HF 221 or COI. Identification, culture and use of deciduous shrubs and small trees in landscape plantings.
- 323. GREENHOUSE ENVIRONMENT CONTROL (5). LEC. 4, LAB. 3. Pr., BI 102, HF 224. Principles and practices of construction and utilizing greenhouses for various purposes such as plant propagation, crop production, and research.
- 324. ELEMENTS AND PRINCIPLES OF LANDSCAPE DESIGN (5). LEC. 3, LAB. 4. Pr., HF 221 and at least 5 hours from the plant materials courses to be taken previously or concurrently, or COI. The art elements and design principles as they relate to Landscape Design. The organization of outdoor spaces leading to the evolution of Landscape Designs emphasized.

328. **LANDSCAPE CONSTRUCTION (5). LEC. 2, LAB. 6.** Pr., HF 226, 324 or COI. Investigation of the principles and practices used in the detail design and implementation of a landscape site plan or landscape planting plan. Topics to be covered: drafting, surveying, properties of construction materials, earthwork, drainage, and specifications.
330. **HORTICULTURE INTERNSHIP (5).** May be taken more than once for a total of 15 hours. Pr., COI, S-U, graded. To provide the student with practical on the job training under supervision in selected commercial establishments to include wholesale and retail nurseries, greenhouses, garden centers, landscape and landscape maintenance firms, and fruit and vegetable horticultural production units. Each term of employment will be for 1 quarter.
410. **HERBACEOUS ORNAMENTAL PLANTS (5). LEC. 3, LAB. 4.** Spring. Pr., HF 221 or COI. Identification, culture, and use of herbaceous annuals and perennials, bulbs, herbs, and ornamental grasses. Consideration of flower bed and border preparation, care, and maintenance.
412. **INTERIOR PLANTSCAPING (3). LEC. 2, LEC-DEM. 2.** Fall. Pr., HF 221 or COI. An introduction to the selection, installation, and care of tropical foliage plants in public interior settings. Topics will include: natural and artificial light, plant acclimatization, growing media, fertilizers, containers, and pest control. About 50 plants common in interior plantings will be identified and their uses and limitations discussed.
415. **RETAIL GARDEN CENTER MANAGEMENT (5). LEC. 4, LAB. 2.** Pr., HF 222, 223, and 321 or COI. The following objectives will be covered: financing, selecting a location, designing a center, stocking, selling, personnel management, advertising, and maintaining plants on the lot.
425. **FLOWER SHOP MANAGEMENT (5). LEC. 4, LAB. 3.** Pr., HF 225, 522, MN 241, ACF 211, COI. Winter, odd years. Principles and practices in the establishment and management of a retail flower shop. Store location, financing, buying, floral design, pricing, and merchandise control.
426. **MINOR PROBLEMS (3-5).** May be taken more than once for a total of 15 hours. Pr., COI. Selected problems in either vegetable production, pomology, food technology, or landscape and ornamental horticulture, on which independent library, field, laboratory, or green house investigations are made, under supervision of instructors.
427. **INTERMEDIATE LANDSCAPE DESIGN (5). LEC. 2, LAB. 6.** Pr., HF 324 or COI. Man, nature, art and technology and their influence on Landscape Design.
428. **ADVANCED LANDSCAPE DESIGN (5). LEC. 2, LAB. 6.** Pr., HF 328, 427, and at least 10 hours from the plant materials courses to be taken previously or concurrently, or COI. Continuation of HF 427.

ADVANCED UNDERGRADUATE AND GRADUATE

521. **CARE AND MAINTENANCE OF ORNAMENTAL PLANTS (5). LEC. 3, LAB. 4.** Pr., BY 306, 309. Winter. Principles and practices of the care and maintenance of trees and shrubs, including pruning, tree surgery, transplanting, and fertilization.
522. **FLORICULTURAL CROP PRODUCTION (5). LEC. 4, LAB. 3.** Pr., AY 304, BY 306, 309, HF 323, ZY 502 or COI. Floricultural crop production under management in greenhouse and outdoor conditions.
523. **NURSERY MANAGEMENT (5). LEC. 3, LAB. 4.** Pr., HF 224, BY 306, AY 304. Winter. Principles and practices of the management of a commercial ornamental nursery.
531. **ADVANCED LANDSCAPE GARDENING (4). LEC. 3, LAB. 4.** Pr., BI 101, HF 221, graduate standing. Principles and practices applying to the use of ornamental plant material in landscaping.
532. **CONTROLLED PLANT GROWTH (5). LEC. 3, LAB. 4.** Pr., AY 304, BY 306, CH 208, HF 323, junior standing. Controlling and directing growth of plants by manipulation of the environment and by the use of chemicals.
535. **ADVANCED CARE AND MAINTENANCE OF ORNAMENTAL PLANTS (5).** Pr., HF 521. This course will include visits to nurseries, landscape construction firms, and landscape maintenance firms. Visits will also be made to installation and maintenance sites. There will be on site participation in all phases of landscape installation and maintenance including extensive experiences in problem diagnosis.
593. **PRACTICUM (1-5).** May be repeated not to exceed 10 hours credit. Not open to majors in Horticulture. Provides students with experience in Horticulture closely relating theory and practice, usually carried on simultaneously.

GENERAL HORTICULTURE

101. **INTRODUCTION TO HORTICULTURE (3). LEC. 2, LEC-DEM. 2.** Fall. An introduction to practical and scientific principles of horticulture. Primarily for new students majoring in horticulture and non-majors who want a general knowledge of the subject. General techniques of ornamental, fruit and vegetable gardening, and career opportunities in horticulture will be discussed.
201. **ORCHARD MANAGEMENT (5). LEC. 3, LAB. 4.** Fall and Spring. Propagating, planting, pruning, cultivating, fertilizing, spraying, thinning, harvesting, grading, storing and marketing the most valuable fruits and nuts grown in the South.
202. **FRUIT AND VEGETABLE PRODUCTION (5). LEC. 3, LAB. 4.** Fall. Adaptation of and cultural practices for fruit and vegetable crops for production in Alabama. Degree credit may not be earned in both HF 202 and HF 201 or HF 308.
308. **VEGETABLE CROPS (5). LEC. 3, LAB. 4.** Fall, Spring, Summer. Principles and special practices used in production of vegetable crops.
330. **HORTICULTURE INTERNSHIP (5).** May be taken more than once for a total of 15 hours. Pr., COI, S-U graded. To provide the student with practical on the job training under supervision in selected commercial establishments to include wholesale and retail nurseries, greenhouses, garden centers, landscape and landscape maintenance firms, and fruit and vegetable horticultural production units. Each term of employment will be for 1 quarter.

340. **INDUSTRIAL FOOD PRESERVATION TECHNOLOGY (5).** LEC. 3, LAB. 4. Pr., COI or junior standing. Winter, even years. Principles of food preservation as applied to industry. Processes considered include refrigeration, pasteurization, canning, freezing, drying, concentration, fermentation, pickling, salting, irradiation, and the use of food additives.
426. **MINOR PROBLEMS (3-5).** May be taken more than once for a total of 15 hours. Pr., COI. Selected problems in either vegetable production, pomology, food technology, or landscape and ornamental horticulture, on which independent library, field, laboratory, or greenhouse investigations are made, under supervision of instructors.
429. **FOOD SCIENCE SEMINAR (1).** Pr., senior standing. Winter. Lectures, discussions and literature reviews by staff, students, and guest lecturers.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **COMMERCIAL VEGETABLE CROPS (5).** LEC. 3, LAB. 4. Pr., HF 308. Fall, even years. Advanced course in production, storing, packaging, and marketing of the major commercial vegetable crops.
504. **FRUIT GROWING (5).** LEC. 3, LAB. 4. Pr., BI 102, HF 201, CH 207. Summer, odd years. Production and marketing of commercial tree fruits grown in the South.
505. **SMALL FRUITS (5).** LEC. 3, LAB. 4. Pr., BI 102. Spring, even years. Principles and practices involved in the production of strawberries, grapes, blueberries, and brambles.
506. **NUT CULTURE (5).** LEC. 3, LAB. 4. Pr., BI 102, CH 207, HF 201. Spring, odd years. Production and marketing of pecans, walnuts, and chestnuts.
543. **FOOD CHEMISTRY (5).** LEC. 3, LAB. 4. Pr., CH 207. Winter. The chemistry of the important components of foods and changes occurring during processing, storage and handling.
545. **FOOD ANALYSIS AND QUALITY CONTROL (5).** LEC. 3, LAB. 4. Pr., HF 543. Spring, even years. Sensory, chemical, and instrumental food analysis and its application to quality control and evaluation of grades and standards.
593. **PRACTICUM (1-5).** May be repeated not to exceed 10 hours credit. Not open to majors in Horticulture. Provides students with experience in Horticulture closely relating theory and practice, usually carried on simultaneously.

GRADUATE

601. **EXPERIMENTAL METHODS IN HORTICULTURE (5).** LEC. 3, LAB. 6. Summer, even years. Purposes of research, discovery, and progress as related to the scientific methods; research programs, horticultural programs, selecting projects, reviewing literature, preparing project outlines, conducting experiments, recording data, analyzing data, and publication of results.
602. **SEMINAR (1).** May be taken more than once for a maximum of three hours credit. Fall, Winter, Spring.
603. **SPECIAL PROBLEMS IN HORTICULTURE (3-5).** (CREDIT TO BE ARRANGED.) Pr., graduate standing. Any quarter. Selected problems in vegetable production, pomology, food technology, or ornamental horticulture.
604. **PLANT GROWTH AND DEVELOPMENT (5).** LEC. 4, LAB. 2. Pr., CH 207 or BY 306, and COI. Winter, even years. Morphological and physiological changes in horticulture plants as induced by growth regulators and their theoretical implications in the improvement of horticultural crops production.
605. **NUTRITIONAL REQUIREMENTS OF HORTICULTURAL PLANTS (5).** LEC. 4, LAB. 2. Pr., BY 306. Winter, odd years. Nutritional requirements of horticulture crops and factors affecting these requirements.
606. **PHYSIOLOGY OF HORTICULTURAL PRODUCTS FOLLOWING HARVEST (5).** LEC. 3, LAB. 4. Pr., BY 306, graduate standing. Summer, even years. Physiological changes occurring in fresh fruits, vegetables, and other horticultural plant products after harvest. Methods of studying these changes and factors influencing them.
607. **BREEDING OF HORTICULTURAL CROPS (5).** LEC. 3, LAB. 4. Pr., ZY 300, graduate standing. Summer, odd years. An application of genetic principles in the propagation and maintenance of fruit, vegetable, and ornamental crop varieties. The genetic basis of some production problems, and special breeding methods applicable to horticultural crops.
699. **RESEARCH AND THESIS.** (CREDIT TO BE ARRANGED.) May be taken more than one quarter.

Industrial Design (IND)

Professors Pfeil and Schaar
Associate Professor Bullock, *Head*
Assistant Professor Leone

D course grades in the following courses must be repeated: 210, 211, 212, 222, 308, 309, 310, 311, 312, 410, 411, and 412.

101. **DESIGN AWARENESS (2).** LEC. 1. A survey course dealing with the profession of industrial design, its scope and philosophy. Credit is given in recognition of attendance at weekly lectures. S-U only.
210. **INDUSTRIAL DESIGN (6).** STUDIO. 12. Pr., sophomore standing. (2.00 overall). Visual communication. Perception theory, design fundamentals; color, figure organization, movement and balance, proportion and rhythm.
211. **INDUSTRIAL DESIGN (6).** STUDIO. 12. Pr., IND 210 and COI. An extension of principles encountered in Industrial Design 210. A study and analysis of Industrial Design Fundamentals.

212. **INDUSTRIAL DESIGN (6). STUDIO 12.** Pr., IND 211 and COI. Structural and functional relationship of design elements; convenience, utility, safety, maintenance.
221. **MATERIALS & TECHNOLOGY (5). LEC. 5.** Pr., sophomore standing. The properties and use of various materials in manufacture and a study of the machine and tool processes used by industry. Survey from the Designer's viewpoint.
222. **TECHNICAL ILLUSTRATION (5). LEC. 5.** Pr., sophomore standing. Pictorial drawing, and freehand graphics as used by Industrial Designers.
223. **INDUSTRIAL DESIGN METHODS (5). LEC. 5.** Pr., sophomore standing. The methods and organizational procedures employed in the analysis and solutions of design problems. Survey of philosophies and theories of design.
307. **ANTHROPOMETRY (5). LEC. 5.** Pr., IND 222, 223, 311, TS 105. Survey and Introduction to the field of body measurements and movements in relation to Design.
308. **DESIGN WORKSHOP (5). LEC. 5.** Pr., IND 210, TS 111. Modelmaking and creative modeling. Study Models, Presentation Models, Mock-ups, Prototypes.
309. **DESIGN COMMUNICATION (5). LEC. 5.** Pr., IND 222. Experiments in visual thinking and modeling.
310. **INDUSTRIAL DESIGN (6). STUDIO 12.** Pr., IND 212, 221, 222, 223, TS 105. (2.00 overall and 2.33 from IND 210, 211, 212.) Emphasis on concept development using drawing and rendering skills for idea communication and presentation.
311. **INDUSTRIAL DESIGN (6). STUDIO 12.** Pr., IND 221, 310. Product design utilizing principles of design methodology from idea stages through working models.
312. **INDUSTRIAL DESIGN (6). STUDIO 12.** Pr., IND 311. Packaging, trademark and corporate identify programs. Exhibition and display fixtures.
385. **SEMINAR IN INDUSTRIAL DESIGN (5). LEC. 5.** Pr., junior standing. Study of selected topics in industrial design.
410. **INDUSTRIAL DESIGN (6). STUDIO 12.** Pr., IND 312, 307, 308, 309. Design or redesign of products and systems.
411. **INDUSTRIAL DESIGN (6). STUDIO 12.** Pr., IND 410, (2.25 overall and 2.50 from IND 310, 311, 312, 410.) Design or re-design of products and systems of advanced complexity.
412. **INDUSTRIAL DESIGN THESIS (6). STUDIO 12.** Pr., IND 411. A project involving all design phases; project of the student's own selection and approved by the instructor. Presentation of graphics, models and written explanations, and oral presentation before a Design Jury. Thesis material may be retained by the Department for one year.
415. **HISTORY OF INDUSTRIAL DESIGN I (5). LEC. 5.** Pr., IND 212. Design from the first Industrial Revolution to the present, with emphasis on the relation between design and science, art, technology, and the humanities.
420. **PROFESSIONAL PRACTICE (5). LEC. 5.** Pr., 4th year standing. Studies in office organizations, contracts, reports, professional ethics, time planning, product litigation, cost estimating, patent policy and related research areas.

ADVANCED UNDERGRADUATE AND GRADUATE

516. **HISTORY OF INDUSTRIAL DESIGN II (5). LEC. 5.** Design from the beginning of artifacts to the first Industrial Revolution, with emphasis on the relationship between design and sciences, art, technology, and the humanities.
585. **SEMINAR IN INDUSTRIAL DESIGN (5). LEC. 5.** Pr., 4th year standing. Development of individual projects. Final design, reports, on approved topics. May be repeated for a maximum of ten hours.
586. **CASE STUDIES IN DESIGN (5). LEC. 5.** Design projects undertaken by industry will be studied by examination of artifacts and records, by interviews with professionals responsible for the phases of the projects, class discussions of this data and its implication. Focus on the socio-cultural relevancy of the artifacts.

GRADUATE

Individual courses available to graduate students in other fields

- 601-602. **PRINCIPLES OF DESIGN (5-5). STUDIO 10-10.** The communication principles of form qualities, with emphasis of these principles to the technical and human factors of artifacts, and to the human visual environment.
605. **DESIGN MANAGEMENT (5). STUDIO 10.** The Industrial Design project management and development with emphasis on the interrelational management concepts of research, product planning, production and marketing.
606. **HUMAN FACTORS IN DESIGN (5). STUDIO 10.** A theoretical and empirical examination of human factors (anthropometrics, Biotechnology, Engineering Psychology, Behavioral Cybernetics, Ergonomics) as applied to man-machine environment systems.
- 608-609. **AESTHETICS IN DESIGN (5-5). STUDIO 10-10.** Aesthetics in the context of the designed environment encompassing such topics as: Non-verbal communication; object language and semiotics; gestalt and perception systems; information aesthetics and consumer product safety.
610. **DESIGN THEORIES (5). STUDIO 10.** An examination of Design Theories and Philosophies as related to technical artifacts in man-machine systems. Comparative studies of unifying theories in Art, Science, Design, Technology and the Humanities.
- 611-612. **DESIGN METHODOLOGY (5-5). STUDIO 10-10.** Industrial Design methodologies and scientific methods employed in research, analysis, synthesis and evaluation in comprehensive design problems. Emphasis on creativity and innovation.

- 613-614. **SYSTEMS DESIGN (5-5). STUDIO 10-10.** Systems approach and interdisciplinary team work to Design problems, inquiries into details of sub-systems, components, and parts, with emphasis on the relation of the performance of technical systems to optimal human factor effects.
- 620-621-622-623. **INDUSTRIAL DESIGN (5-5-5-5). STUDIO 10-10-10-10.** Synthesizing studies in research, analysis and application based on an interdisciplinary concept. The project content is according to the student's interest from one or several of the following design areas: Product Design, Industrialized Housing, Package Design, Corporate Communications, Transportation Design, Exhibition Design and Systems Implementation. Emphasis on the relation of products and systems to those who use them.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Industrial Engineering (IE)

Professors Unger, *Head*, Black, Cox, Hool, Maghsoodloo, and Webster
 Associate Professors Blakney, Bulfin, Herring, Layfield, Smith,
 Park, and White
 Assistant Professors Clement, Conner, Jiang, Morrissey,
 Mykytko, and Wingard
 Instructors Durbin, Goff, Leach, and Schaer

General Curriculum, GC, students (those with undeclared majors) may enroll only with departmental consent.

100. **INTRODUCTION TO MANUFACTURING PROCESSES (2). LEC. 1, LAB. 2.** Laboratory oriented studies in economic production principles related to mental and plastic product manufacturing.
102. **GRAPHICAL COMMUNICATION & DESIGN (2). LAB. 6.** Graphical technique and projective geometry relating to spatial visualization and communication in design.
103. **COMPUTER GRAPHICS (3). LEC. 2, LAB. 3. Pr., IE 102 or COI.** An introduction to computer graphics with application to selected engineering problems.
105. **ENGINEERING DRAWING II (2). LAB. 6. Pr., IE 102.** Advanced phases of graphical techniques and conventions including technical sketching.
107. **GRAPHICAL ANALYSIS AND DESIGN (2). LAB. 6. Pr., IE 102.** Application of orthographic projection principles in solving engineering problems.
108. **DESIGN FOR MANAGEMENT (2). LAB. 6. Pr., IE 102, 107 or equivalent.** Fundamental graphical concepts relative to management activities including design and communication.
111. **WOODWORKING (1). LAB. 3.** Introduction to machines, tools, and materials used in working with wood.
112. **WELDING SCIENCE AND APPLICATION (1). LAB. 3.** Basic principles and application of welding and cutting processes in the fabrication of metals.
113. **MACHINE TOOL LABORATORY (1). LAB. 3.** Introduction to metal removal processes; basic machines of production.
114. **SHEET METAL DESIGN AND FABRICATIONS (1). LAB. 3.** Methods and equipment used in design, production and fabricating of sheet metal products.
115. **FOUNDRY TECHNOLOGY (1). LAB. 3.** Basic fundamentals involved in casting products of ferrous and nonferrous metals.
202. **ENGINEERING COMPUTATION (3). Pr., MH 162.** Introduction to the fundamentals of computer programming and engineering computation through user oriented computer languages. (Open to students in the School of Engineering only.)
204. **KINEMATICS OF MACHINES (3). LEC. 2, LAB. 3. Pr., IE 105 and PS 220.** Spring. Graphical analysis of machine elements including velocity diagrams.
300. **COMPUTER PROGRAMMING AND INTRODUCTION TO INFORMATION-DECISION SYSTEMS (3). LEC. 2, LAB. 3. Pr., an introductory knowledge of FORTRAN, MH 254 or concurrently.** Intermediate computer programming using the FORTRAN programming language with emphasis on mathematical and engineering problems. Included are introductory design considerations for information-decision systems involving computers as a principal data processing device.
305. **INFORMATION-DECISION SYSTEMS (3). LEC. 2, LAB. 3. Pr., IE 300.** Interrelated components of complex management information-decision systems. Design considerations for systems involving computers as a principle data processing device.
308. **GAGES AND MEASUREMENTS (5). LEC. 4, LAB. 2.** The science of measurement as applied to production and inspection of industrial products.
311. **ENGINEERING STATISTICS I (3). Pr., MH 264.** Basic probability, random variables and distribution functions.
323. **ENGINEERING STATISTICS II (5). Pr., IE 311.** Distribution functions, tests of hypotheses, estimation, regression and correlation methods and introduction to analysis of variance.

333. **ENGINEERING STATISTICS III (4).** Pr., IE 323. Continuation of IE 323. Included are two-way analysis of variance, χ^2 goodness-of-fit, and statistical quality control. Emphasis is on quality control.
342. **LINEAR PROGRAMMING (3).** Pr., MH 266, IE 300. Introduction to linear programming with emphasis on model formulation, solution and optimality analysis.
346. **ERGONOMICS I: METHODS ENGINEERING AND WORK MEASUREMENT (4).** Coreq., IE 323, 347. The analysis and design of work methods and work places. Work measurement techniques including stopwatch time study, work sampling, and predetermined motion times.
347. **ERGONOMICS I LABORATORY (1).** LAB. 3. Coreq., IE 346. Experiments and laboratory exercises in methods engineering and work measurement.
352. **DETERMINISTIC OPERATIONS RESEARCH MODELS (3).** Pr., IE 342. Introduction to deterministic operations research with emphasis on model formulation, solution and interpretation of results. Particular models covered include network optimization, integer programming and dynamic programming.
360. **ENGINEERING ECONOMIC ANALYSIS (3).** Pr., MH 264, EC 200 (IE students only), and introductory computer programming. The development of principles required in engineering economy studies and other decision-making oriented courses. Topics include interest and interest formula derivations, economic decision criteria, capital budgeting, depreciation methods, tax considerations, replacement analysis and inflation.
390. **SEMINAR IN INDUSTRIAL ENGINEERING (1).** LEC. 1. Pr., junior standing in IE. Discussion of current problems, professional practice, and professional opportunities. (Restricted to Industrial Engineering majors and is to be taken in the third or fourth quarter prior to graduation.)
402. **ADVANCED WOODWORKING (5).** LEC. 3, LAB. 4. Pr., IE 111. Design, construction, and finishing fine objects of wood.
405. **PROBLEMS IN WELDING ENGINEERING (5).** LEC. 3, LAB. 4. Pr., IE 112. Advanced phases and techniques of welding and allied processes. Problems in design, weldability of metals, inspection practice, and selection of equipment.
406. **ERGONOMICS II: OCCUPATIONAL ERGONOMICS FUNDAMENTALS (3).** Pr., IE 347, PG 321; Coreq., IE 407. Ergonomic principles and measurement techniques in the areas of anthropometry, display/control design, work physiology, work environment assessment, and manual materials handling.
407. **ERGONOMICS II LABORATORY (1).** LAB. 3. Coreq., IE 406. Experiments and laboratory exercises in work physiology, heat and noise stress, manual materials handling, and the design of work places, displays, and controls.
408. **PROBLEMS IN MACHINING (5).** LEC. 3, LAB. 4. Pr., IE 113. Advanced phases of metal machining with emphasis on production machines and accessories.
412. **STOCHASTIC OPERATIONS RESEARCH MODELS (3).** Coreq., IE 352, 333. Introduction to stochastic operations research with emphasis on model formulation, solution and interpretation of results. Particular models covered include decision analysis, stochastic processes, queueing and stochastic dynamic programming.
416. **SIMULATION (3).** LEC. 2, LAB. 3. Pr., IE 305, 323. Simulation procedures for solving complex systems analysis problems. Emphasis on random processes, model building, and construction of computer simulation models.
422. **PRODUCTION CONTROL FUNCTIONS I (4).** Pr., IE 360, 342, 346. Functions of production control: forecasting; inventory analysis; scheduling; dispatching and progress control.
425. **PRODUCTION CONTROL FUNCTIONS II (3).** Pr., IE 422. Functions of production control: production planning; line balancing; plant location; plant layout; manufacturing processes.
427. **OPERATIONS AND FACILITIES DESIGN I (3).** LEC. 2, LAB. 3. Pr., IE 406, 407, 425 or concurrently. Design principles and concepts of complex systems. (Should be taken the quarter immediately prior to the taking of IE 428.)
428. **OPERATIONS AND FACILITIES DESIGN II (3).** LAB. 9. Pr., IE 412, 427. The design of industrial, institutional, governmental and service operations and facilities. (Should be taken during student's final quarter.)
436. **PLANT LOCATION (3).** Pr., IE 342, 360, 412. Factors and techniques pertinent to the economic location of industrial plants.
438. **OCCUPATIONAL SAFETY AND HEALTH ENGINEERING (5).** Pr., COI, or senior standing. Occupational safety and health problems with emphasis on the role of the industrial engineer in the elimination of physical and environmental hazards.
460. **INTERMEDIATE ENGINEERING ECONOMIC ANALYSIS (3).** LEC. 3. Pr., IE 360, 412. Continuation of IE 360. Emphasis on cost estimating techniques and applications of engineering economic principles to various aspects of industrial engineering problems.
- 490-491-492. **INDUSTRIAL ENGINEERING PROBLEMS (1-5).** Pr., COI and department head approval. Individual student endeavor under staff supervision involving special problems of an advanced nature in Industrial Engineering.

COURSES NOT OPEN TO IE MAJORS

201. **INDUSTRIAL ADMINISTRATION (3).** Pr., sophomore standing. The concepts, techniques, and functions of engineering management.
220. **APPLIED STATISTICS (5).** Pr., MH 161. Introduction to probability and statistical methods including descriptive statistics, probability and probability distributions, sampling, estimation, regression, time series, index numbers ranking, and analysis of variance. Applications to administrative and production-service functions will be emphasized.

- 302. PRODUCTION CONTROL TECHNIQUES (3).** Pr., IE 201 or MN 310. Planning, scheduling, routing, and dispatching in manufacturing operations. Mechanisms for production control.
- 310. MOTION AND TIME STUDY (5).** LEC. 4, LAB. 3. Pr., IE 220 or MN 274. Principles and practices of methods engineering and time study.
- 320. ENGINEERING ECONOMY (5).** Pr., MH 161, junior standing. Practical engineering studies for the economic selection of structures, equipment, processes and methods. (Not open to students with credit in IE 360.)
- 330. DECISION ANALYSIS (5).** Pr., IE 220 or equivalent. A quantitative analysis of the decision-making process involving models of certainty, risk, and uncertainty with applications to marketing, production, and administration. (Not open to engineering students.)
- 410. ENGINEERING STATISTICS (5).** Pr., MH 264 or COI. Basic probability, random variables, discrete and continuous distributions, sampling distributions, hypothesis testing, estimation, regression and correlation, one-way analysis of variance, testing goodness of fit. (Not open to students with credit in IE 311.)
- 411. OPERATIONS RESEARCH (5).** Pr., MH 266, IE 410 or equivalent or concurrently. Model construction, linear programming, network models, dynamic models, stochastic models, queueing theory, decision theory and simulation. (Not open to students with credit in IE 352.)
- 479. HONORS THESIS (1-6).** Pr., COI and department head approval. Individual student endeavor consisting of directed research and writing of honors thesis. (IE Honors Program students only. May be repeated once for a maximum of 6 total credit hours.)

ADVANCED UNDERGRADUATE AND GRADUATE COURSES

- 502. SYSTEMS ANALYSIS FOR SAFETY (3).** Pr., IE 311 or 410 or COI. Problem identification, evaluation of safety performance, cost-benefit and optimization techniques. Fault free analysis, system safety and reliability.
- 508. HUMAN FACTORS ENGINEERING (5).** Pr., PG 211 or 212 or COI. Human factors engineering in systems design including applied anthropometry, work place design, assessment of work, noise and heat stress; and equipment design. (Not open to students with credit in IE 406.)
- 509. ERGONOMICS III: WORK PHYSIOLOGY (3).** Pr., IE 406 or 508 or COI. Evaluation of the physiological response of the body to occupational activities with emphasis upon task design and employee selection/placement.
- 510. ERGONOMICS IV: ENVIRONMENTAL WORK STRESS (3).** Pr., IE 406 or 508 or COI. Evaluation of the response of the worker to the physical work environment. Emphasis is upon design to minimize stress.
- 511. ERGONOMICS V: OCCUPATIONAL BIOMECHANICS (3).** Pr., IE 406 or 508, ME 321, or COI. The use of biomechanics in the evaluation and design of work activities. Emphasis is on manual materials handling, tool design, and repetitive motion trauma.
- 512. ERGONOMICS VI: DATA COLLECTION PROCEDURES (3).** LAB. 9. Pr., IE 509, 510, and 511 or COI. Laboratory and field experiences in the collection of ergonomics data. Emphasis is placed upon proper use of equipment and methodology in the collection of work response data from occupationally active human subjects.
- 513. ERGONOMICS VII: DESIGN OF NON-STRENUOUS TASKS (3).** Pr., IE 406 or 508 or COI. Ergonomics considerations in the design of non-strenuous (typically information processing) tasks. Emphasis is placed upon the minimization of human error and task induced stress.
- 514. ERGONOMICS VIII: LABOR PRODUCTIVITY ASSESSMENT (3).** Pr., IE 346 or COI. Advanced topics in the area of work measurement.
- 515. SENSITIVITY ANALYSIS IN OPERATIONS RESEARCH MODELING (3).** Pr., IE 412 and 416 and 422 or the equivalent, or COI. An investigation of how an operations research model's decisions and returns change with respect to changes in model parameters and characteristics. Several types of models are considered, and examples are presented.
- 520. PRINCIPLES OF INTERACTIVE COMPUTER GRAPHICS (3).** Pr., MH 266, IE 202 or equivalent, or COI, and junior standing. Computer graphics with emphasis on engineering applications. Typical topics include hardware characteristics of graphics system, mathematical elements and programming techniques for two-dimensional and three-dimensional graphics, user interface design and selected engineering applications.
- 540. SAMPLING AND SURVEY TECHNIQUES (3).** Pr., IE 323. Theory and application of statistical sampling and survey methods, with emphasis on methods optimization.
- 541. APPLIED INDUSTRIAL ENGINEERING MATHEMATICS (3).** Pr., MH 265. Formulation and solution of differential and difference equations. Solution techniques will include analytical theory, Laplace and Z transforms and computer techniques. Introduction to state variables, matrix algebra and analysis.
- 542. ADVANCED LINEAR PROGRAMMING (3).** Pr., IE 342. Continuation of 342 with emphasis on theory. Revised simplex, dual simplex, parametric programming, decomposition, and applied problems.
- 543. INVENTORY CONTROL (3).** Pr., IE 333, 412, 422. Application of quantitative methods to the control of industrial inventories.
- 548. ENGINEERING METROLOGY (1-5).** Pr., departmental approval. Design, construction, and use of precision measuring equipment and gages.
- 550. SEARCH METHODS FOR OPTIMIZATION (3).** Pr., MH 264 or COI and senior standing. Single and multivariate search techniques and strategies which are used in finding the optimum of discrete or continuous functions about which full knowledge is not available.

553. **DYNAMIC PROGRAMMING (3).** Pr., IE 412 or COI. The theory and methods of dynamic programming will be presented. Specific applications will be discussed.
556. **INTERMEDIATE SIMULATION (3).** Pr., IE 416, junior standing. Intermediate simulation techniques including an in-depth study of a simulation language.
558. **RELIABILITY ENGINEERING (3).** Pr., IE 323. Reliability, maintenance, and replacement, with emphasis on quantitatively descriptive methods to be used for problem solving.
559. **OPERATIONAL CONTROL SYSTEM DESIGN (3).** Pr., IE 425. The design of operational planning and control systems. Integration of individual systems functions. concept of total systems optimization.
560. **MATERIALS HANDLING SYSTEMS (3).** Pr., IE 412, 416. Quantitative analysis and design of material handling systems. Quantitative methods and case studies.
561. **ADVANCED FACILITIES DESIGN (3).** Pr., COI. Quantitative methods used to design production and service facilities are emphasized. Case studies.
566. **INDUSTRIAL MAINTENANCE ENGINEERING (3).** Pr., IE 305, 422 or COI. Industrial maintenance and organization including planning and scheduling, motivation, inspection, preventive maintenance, replacement, data processing and relation to other areas.
570. **SCHEDULING: THEORY AND APPLICATIONS (3).** Pr., IE 411 or 412 or COI. Network based sequencing and scheduling problems. Numerous algorithms are presented for scheduling facilities to achieve one or more of several desirable objectives within precedence and resource constraints. Scheduling areas discussed include projects, assembly lines, flow shops and job shops.
571. **CONTINUOUS PROCESS CONTROL AND DYNAMICS (3).** Pr., IE 541. Continuous process dynamics and block diagram formulation. Conventional continuous process control and introduction to advanced control topics.
572. **ENGINEERING OF ORGANIZATION AND MANAGEMENT (3).** Pr., COI, senior standing. Organizational theory and concepts; the interaction between the individual and the organization.
575. **PROJECT MANAGEMENT (3).** Pr., IE 411 or 412 or COI. Project management and development with primary emphasis on use of operations research methods and cost analysis. Study of the applications of CPM, PERT, and GERT to project management.

GRADUATE

606. **ERGONOMICS IX: ADVANCED TOPICS-STRENUOUS WORK (3).** Pr., IE 509, 510, and 511 or COI. Evaluation of current research activities in the areas of work physiology, biomechanics, and environmental stress.
607. **ERGONOMICS X: ADVANCED TOPICS-NON-STRENUOUS WORK (3).** Pr., IE 513 or COI. Evaluation of current research in the area of human information processing. Emphasis is on human decision behavior modeling.
616. **INDUSTRIAL DYNAMICS (3).** Pr., IE 416 or COI. Industrial dynamics based on a systems approach to industrial and related problems, with emphasis on decision-making.
617. **ADVANCED SIMULATION PROBLEMS (3).** Pr., IE 416 or COI. Journal readings of applications simulation and development of procedure to solve large scale, realistic simulation problems.
620. **ADVANCED ENGINEERING ECONOMY (3).** Pr., IE 460 or COI. Engineering and economic aspects of project design and analysis. Advanced treatment is given to the following topics: capital budgeting, financing manufacturing organizations, risk and sensitivity analysis, mathematical programming approach to investment decisions, and forecasting methods including input-output analysis.
621. **MARKOV CHAINS (3).** Pr., IE 412. Finite and continuous Markov Chains, Poisson and Wiener processes, applications will be discussed.
622. **QUEUEING THEORY (3).** Pr., IE 323 or 410, IE 621, or COI. Mathematical models of queueing, with applications to problems such as materials flow, inventory policy, and service center design. Simulation solutions to queueing networks are considered.
623. **TIME SERIES (3).** Pr., IE 412. Stationary stochastic processes, time series analysis with emphasis on spectral density functions and applications will be discussed.
624. **INVENTORY AND PRODUCTION CONTROL SYSTEMS (3).** Pr., IE 425. Advanced topics in production control and inventory theory. The relationships between production and inventory will be discussed.
625. **ADVANCED SCHEDULING THEORY (3).** Pr., IE 570. A survey of models and methodologies in the areas of sequencing and scheduling are presented. Models covered include: the single processor model, parallel processor model, flow shops and job shops. Methodologies covered include: Integer and dynamic programming, branch and bound and other enumeration procedures as well as simulation and sampling and search methods.
630. **ADVANCED STATISTICAL METHODS FOR ENGINEERS I (3).** Pr., IE 323 or equivalent. Basic concepts of statistical experimental design including randomization methods, analysis of variance methods, mathematical derivation of expected mean squares multiple comparison tests, and the Bennett and Franklin algorithm.
631. **ADVANCED STATISTICAL METHODS FOR ENGINEERS II (3).** Pr., IE 630 or COI. Extension of IE 630, with primary emphasis on analysis of variance methods.
632. **ADVANCED STATISTICAL METHODS FOR ENGINEERS III (3).** Pr., IE 630 or COI. Elaboration of basic statistical methods for engineers, with emphasis on a more theoretical study of multiple linear regression and the optimization of multiple linear regression methods.

634. **NON-LINEAR PROGRAMMING (3).** Pr., IE 542. This course covers quadratic programming, separable programming, gradient methods, and integer programming.
635. **INTEGER PROGRAMMING (3).** Pr., IE 352 and IE 542 or COI. Integer programming and discrete optimization emphasizing applications, formulation, solution techniques and theory.
640. **NONPARAMETRIC STATISTICS (3).** Pr., IE 323. The theory and application of several nonparametric and distribution-free statistical methods with emphasis on engineering applications.
642. **INPUT-OUTPUT ANALYSIS (3).** Pr., IE 542 or COI. Input-Output analysis for interindustry, industry, and company study. Computational aspects of large scale models. Case studies.
644. **OPTIMIZATION THEORY FOR LARGE SYSTEMS (3).** Pr., IE 634 or COI. Large problems with special structures; decomposition principle, many column problems, relaxation procedures, in linear programming, generalized upper bounding, partitioning procedures, and applications.
653. **ADVANCED DYNAMIC PROGRAMMING (3).** Pr., IE 553. Advanced topics in the theory and application of dynamic programming. Numerical methods to solve specific types of problems. Case studies.
661. **QUEUEING APPLICATIONS (3).** Pr., IE 622 or COI. Computer-communication networks based upon queueing theory.
663. **DECISION AND GAME THEORY (3).** Pr., IE 323 or 410 or COI. Classification of decision problems, Bayes risk, utility theory and its applications, optimal strategies for rectangular games, and use of linear programming in solving zero-sum games.
664. **MANAGEMENT INFORMATION DECISION SYSTEMS (3).** Pr., COI. Analysis of organizations for information requirements, information flow, data storage and usage and total information systems.
670. **ADVANCED COMPUTATION METHODS (3).** Pr., COI. Advanced computer languages, pattern/recognition, and hybrid computation. This course is designed to keep the graduate student abreast of current ideas in this rapidly expanding field.
671. **DISCRETE PROCESS CONTROL AND DYNAMICS (3).** Pr., IE 571. Sampled-data control systems and computer control topics. Representation of discrete industrial processes.
672. **FUNCTIONAL OPTIMIZATION THEORY (3).** Pr., IE 412. Introduction to functional optimization theory including min-max theory, calculus of variations, Pontryagin maximum principle and applied functional analysis.
675. **ADVANCED OPERATING SYSTEMS DESIGN (3).** Pr., CSE 230 or COI. Advanced software design methodology and applications focusing on computer operating systems.
676. **TELEPROCESSING SYSTEMS SOFTWARE (3).** Pr., IE 622. An introduction to the theory and methods used in developing telecommunication systems software.
680. **ADVANCED TOPICS IN OCCUPATIONAL SAFETY AND HEALTH (3).** Pr., IE 438 or equivalent. Coreq., IE 607 and 631, or COI. Selected topics including accident proneness, risk taking, and systems safety are pursued at the advanced level. Quantification and modeling are emphasized.
687. **FORMAL THEORY OF COMPUTER LANGUAGES II (3).** Pr., CSE 520 or COI. An indepth study of compiler principles including symbol tables, source and object program optimization, semantic analysis, storage organization, and code generation.
688. **METHODS OF SORTING AND SEARCHING (3).** Pr., CSE 360 or COI. An introduction to the theoretical and practical aspects of searching and sorting via the digital computer. Study of algorithms necessary to create and optimize a sort or search routine.
- 690-691-692. **INDUSTRIAL ENGINEERING PROJECTS (1-5).** Pr., COI and departmental head approval. Individual student endeavor under staff supervision involving special problems of an advanced nature in Industrial Engineering.
696. **SEMINAR (1).** Pr., IE Graduate Student Standing. Must be taken at least one quarter, but cannot be used in the student's plan of study to apply toward the minimum number of hours for the degree. Presentation and discussion of current I.E. research activities by students, faculty, and guests.
698. **M.I.E. DESIGN PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Interdepartmental Education (IED)

Included in this section are program areas and course listings designed and taught on the interdepartmental basis.

101. **CAREER EXPLORATION AND PLANNING (1).** LEC. 1. Helps undeclared freshmen in planning their professional careers.

GRADUATE

517. **PROFESSIONAL WRITING IN EDUCATION (2).** Fundamentals of education discourse; strategies and techniques in educational writing; reference sources; the preparation of manuscripts for publication in professional journals.
605. **PRACTICUM IN EDUCATIONAL ASSESSMENT AND PRESCRIPTIVE REPORT WRITING (5).**

750. **ALTERNATIVE RESIDENCE SEMINAR (2-2-2).** Required of students in an alternative residence plan. These students must complete this three quarter sequence during the fall, winter, and spring quarters. Credit does not count toward minimum requirements for the Doctor of Education degree.

Journalism (JM)

Professors Simms, *Head*, Campbell and Logue
Associate Professors Brown and Morgan
Assistant Professors Williams and Hoxsie

Freshman English is prerequisite for all journalism courses except JM 101.

101. **NEWSPAPER STYLE (3).** Required for all journalism majors and minors. The AP-UPI Stylebook and common errors in word selection in newspaper writing.
204. **INTRODUCTION TO PUBLIC RELATIONS (5).** The various communication skills and technologies for public relations will be explored. Credit for this course precludes credit for SC 204.
221. **BEGINNING NEWSWRITING (5).** Pr., JM 101; reasonable typewriting skills. Introduction to newswriting, newspaper style, and mechanical practice.
222. **NEWSPAPER LAB (1).** Pr., JM or PRJ major, JM 221. (S-U grading only). Student will work a minimum of 20 hours for *The Auburn Plainsman* in reporting, writing, editing or page makeup.
313. **REPORTING (5).** Pr., JM 221; reasonable typewriting skills. The technical aspects of reporting and newsgathering methods.
314. **COPYREADING AND EDITING (3).** Pr., JM 221. Methods of editing copy, writing headlines and proof reading.
315. **TECHNICAL JOURNALISM (3).** Not to be used for a major or minor in Journalism. Introduces practices of news coverage and writing.
321. **NEWSPAPER MAKEUP AND LAYOUT (5).** Pr., JM 221. Typography and design with practice applications in putting together newspaper pages.
322. **FEATURE WRITING (5).** Pr., JM 221 or COI. Gathering material for the writing of "human interest" and feature articles for newspapers and magazines, with consideration given to the marketing of manuscripts.
323. **THE COMMUNITY NEWSPAPER (5).** Pr., JM 221 and 321. Methods, problems, and policies involved in editing the community newspaper, as differing from the metropolitan daily.
355. **REPORTING OF POLITICAL AFFAIRS (3).** Pr., PO 210. Instruction and news assignments in political affairs. Credit in PO 355 precludes credit in JM 355.
421. **PHOTO-JOURNALISM (5).** Uses and processes of photography in the newspaper and magazine field. Operation of press cameras and the technique of developing, printing, and enlarging of pictures is provided.
- 422-423. **JOURNALISM WORKSHOP (3-3).** Pr., JM 313, 314, 321, 322, COI. A two-quarter course giving practical experience in preparation of newspaper, radio, television, and magazine copy through supervised work. The student is expected to work 10 hours per week.
425. **JOURNALISM INTERNSHIP (6).** Pr., JM 313, 314, 321, 322, COI. A full-time internship of at least ten weeks with an approved publication, serving as a regular staff member under the direction of the editor.
435. **MAGAZINE EDITING AND PRODUCTION (5).** Pr., JM 221. Methods and problems of publishing the popular and trade magazine.
465. **THE HISTORY AND PRINCIPLES OF JOURNALISM (5).** The development of the American Press, the principles and ideals of modern journalism, and the law of the press and radio.
475. **JOURNALISM SPECIAL STUDIES (1-5).** Pr., Departmental approval. Research and analysis of specific journalistic problems. Or lectures and seminars by visiting professional journalists.
485. **ADVANCED REPORTING (3).** Pr., JM 313, 314, 321, 322, COI. Developing and writing news stories under deadline pressure; investigative and interpretive reporting.
504. **PUBLIC RELATIONS CASE STUDIES AND PROBLEM SOLVING (5).** Pr., JM 204 or SC 204 or COI. Techniques in solving public relations problems. Credit for this course precludes credit for SC 504.

Laboratory Technology (LT)

Associate Professor Kohl
Adjunct Associate Clinical Professors Adams, Bridger, Davis, C. B. Elliott,
H. C. Elliott, and Wert
Adjunct Instructors Estridge and Reynolds
Adjunct Clinical Instructors Cooper, Crider, Harrison, and Lushington

101. **ORIENTATION (1).** Fall, Winter. Aims, objectives, and requirements for careers in Medical and Laboratory Technology.

301. **HEMATOLOGY (5).** LEC. 3, LAB. 6. Pr., CH 208. Origin, maturation, morphology and function of blood cells; theory of hemostasis; routine hematological laboratory techniques.
401. **ADVANCED HEMATOLOGY (5).** LEC. 3, LAB. 6. Pr., LT 301. Advanced study of lymphohematopoietic and hemostatic disorders; laboratory techniques for evaluation and diagnosis of blood disorders.
404. **IMMUNOLOGY I (5).** LEC. 3, LAB. 4. Pr., BY 300, junior standing. Basis of the immune response, mechanisms of immunity, laboratory tests for cellular function and detection and measurement of antigen-antibody reactions.
405. **IMMUNOLOGY II (5).** LEC. 3, LAB. 6. Pr., LT 404, junior standing. Immunogenetics, clinical significance of blood group antigens and antibodies, theory and techniques of the serological study of human blood groups.
422. **HOSPITAL LABORATORY PRACTICE (5).** LAB. 15. Pr., LT 301. Practice applications of the principles, procedures, and techniques encountered in hospital laboratories.
525. **CLINICAL LABORATORY INSTRUMENTATION (5).** LEC. 3, LAB. 6. Pr., CH 519 or 508 or COI. Theoretical and practical application of continuous flow analysis, atomic absorption spectrophotometry, radioimmunoassay and chromatographic techniques used in the analysis of body fluids.

Law Enforcement (LE)

(DEPARTMENT OF POLITICAL SCIENCE)

Assistant Professors Kelly and Pendergast, *CJ Coordinator*
Adjunct Assistant Professor G. H. Wright

260. **SURVEY OF LAW ENFORCEMENT (5).** Pr., sophomore standing. Introduction to the philosophical and historical backgrounds; agencies and processes; purposes and functions; administration and technical problems; career orientation. Credit for this course precludes credit for PO 260.
261. **CRIMINAL EVIDENCE (3).** Comprehensive analysis of the rules of evidence with particular emphasis on evidence obtained through search, seizure, and arrest.
262. **CRIMINAL INVESTIGATION (5).** Pr., sophomore standing. Criminal investigation procedures, including theory of investigation, case preparation, specific techniques for selected offenses, questioning of suspects and witnesses, and problems in criminal investigation.
270. **CAREER EXPLORATION AND PLANNING (2).** Pr., LE/PO 260 and COI. (S-U grading only.) Career opportunities and demands. Offered all quarters for CJL and CJO. Offered only Fall and Winter quarters for CJY with orientation and participation prior to the quarter.
335. **CRIMINAL LAW FOR POLICE OFFICERS (3).** Pr., PO 209, 210, or LE/PO 260. Statutory criminal law and criminal court procedures as applicable to the law enforcement function. Considers the impact of statutory law and common law on police procedures and policies.
361. **SURVEY OF CRIMINALISTICS (5).** Pr., LE 262, junior standing. Survey of scientific crime detection methods; crime scene search, identification and preservation of evidence, lie detection, *modus operandi*, fingerprint identification, and related subjects.
363. **POLICE ADMINISTRATION AND ORGANIZATION (5).** Pr., junior standing. Principles of organization and administration in law enforcement; functions and activities; planning and research; community relations; personnel and training; inspection and control; policy formulation.
451. **CRIMINAL JUSTICE INTERNSHIP READING COURSE (5).** Coreq., concurrent enrollment in LE 464 or U (LE) 399 and COI. Content of reading by agreement of student and instructor.
461. **SEMINAR IN POLICE PROBLEMS (5).** Pr., LE 363 or 464. Review Analysis of major contemporary problems and issues.
464. **INTERNSHIP IN CRIMINAL JUSTICE (5-10).** Pr., consent of department head and junior standing. Internship in an approved law enforcement or correctional agency under supervision of the agency concerned. Written reports on internship required.

Management (MN)

Professors Holley, *Head*, Alexander, Armenakis, Bedelian, Feild, Giles, and Henry
Associate Professors Adams, Ledbetter, Mitra, Mossholder, Niebuhr,
Norris, Snow, and Snyder
Assistant Professors Boyett, Bradbard, Davis, Ford, Fortenberry, Landis,
Rhyne, Tillman, and Wolters

207. **INTRODUCTION TO COMPUTER PROGRAMMING (3).** Pr., 10 hours math, sophomore standing. Introduction to the use of the computer as a tool in solving business problems, using an appropriate programming language in both a time shared and batch processing environment.
274. **BUSINESS AND ECONOMIC STATISTICS I (5).** Pr., MH 169 or equivalent, and MN 207. Frequency distribution and time series analysis, index numbers; probability; binomial and normal distributions; introduction to statistical inference.
305. **ADVANCED COMPUTER PROGRAMMING (4).** Pr., MN 207. File handling, formatted output, structured programming, string manipulation, applications program/operating systems intercommunication.

307. **BUSINESS COMPUTER APPLICATIONS (4).** Pr., MN 207, Computerizing business applications using a current business language.
310. **PRINCIPLES OF MANAGEMENT (4).** Pr., junior standing. Management functions and the application of management principles in organizations.
346. **ORGANIZATIONAL BEHAVIOR (4).** Pr., MN 310, junior standing. Analysis and application of theories and techniques for understanding, prediction, and management of human behavior in the organizational context.
374. **BUSINESS AND ECONOMIC STATISTICS II (5).** Pr., MN 274 or equivalent, junior standing. Probability distributions including the Poisson and "t" distributions, advanced time series analysis; chi square; multiple and partial correlation; statistical decision theory.
375. **NONPARAMETRIC STATISTICS (3).** Pr., MN 274. The analysis of business and economic data by distribution-free statistical methods.
380. **PRINCIPLES OF OPERATIONS MANAGEMENT (4).** Pr., MN 274, 310, junior standing. Modern scientific management as applied in the actual control and operation of industrial enterprises.
381. **MANAGEMENT DECISION MAKING (5).** Pr., MN 274, MN 207, 310, junior standing. Various quantitative techniques as aids in managerial decision making under conditions of imperfect knowledge.
382. **MANAGEMENT INFORMATION SYSTEMS (4).** Pr., MN 207, 310, 380. Analysis, design, and implementation of information systems for the management of complex organizations.
385. **PRODUCTIVITY MANAGEMENT (5).** Pr., MN 380, junior standing. Application of management procedures and techniques to analyze and control production methods and processes.
386. **MATERIALS MANAGEMENT I (5).** Pr., MN 380, junior standing. Application of management procedures and techniques to the acquisition, utilization, and distribution of materials in product manufacturing.
387. **MATERIALS MANAGEMENT II (5).** Pr., MN 386, junior standing. Continuation of MN 386, includes material requirements planning, capacity planning and control, and shop floor control.
400. **STUDENT INTERNSHIP PROGRAM (1-10).** Pr., junior standing and selection by the committee directing the School of Business Intern Program.
401. **ANALYSIS AND DESIGN OF BUSINESS INFORMATION SYSTEMS (5).** Pr., MN 382 or equivalent. General systems techniques, systems analysis and design, database considerations, modern developments, project planning and control, total system integration.
410. **INTERNATIONAL BUSINESS MANAGEMENT (5).** Pr., EC 200, 202, MN 310, MT 331, ACF 361, junior standing. Management of multinational firms which own subsidiaries in several countries.
415. **SMALL BUSINESS MANAGEMENT (5).** Pr., senior standing or COI. A consulting opportunity which provides a test of the student's ability to apply skills and knowledge to the problems of an existing small business.
420. **INDUSTRIAL PROCUREMENT (5).** Pr., MN 380, junior standing. Role, procedures, responsibilities, and management of materials acquisition function in industry.
440. **ORGANIZATION THEORY (5).** Pr., MN 346, junior standing. Organizations as socio-economic-political systems for collective action imbedded in a largely uncontrollable environment.
442. **PERSONNEL MANAGEMENT (4).** Pr., MN 310, junior standing. Management of labor, dealing with selection, training, placement, turnover, payment policies, employee representation, etc.
447. **EMPLOYEE COMPENSATION (4).** Pr., MN 442, junior standing. Factors, philosophy, design, and problems of administration in compensation program.
470. **HONORS THESIS (1-6).** Pr., open only to persons in the University Honors Program and with consent of the student's Honors Adviser.
474. **QUALITY ASSURANCE (3).** Pr., MN 274, 380, junior standing. Fundamental concepts in quality assurance; tools and techniques necessary to carry out quality assurance functions; use of control charts and acceptance sampling plans.
475. **MULTICRITERIA DECISION MAKING (3).** Pr., MN 380, 381. Quantitative methods and their application in production and distribution problems of business.
480. **BUSINESS POLICIES AND ADMINISTRATION (5).** Pr., ACF 211, 212, 361, EC 200, 202, EHA 415, MN 274, 310, 346, 382 or ACF 415, MT 255, 331, senior standing. Formulation and application of objectives, strategy, and policies pertaining to a total organization. Emphasis on problem-solving and the relationships between the functional areas of an organization.
484. **ADVANCED OPERATIONS MANAGEMENT (5).** Pr., ACF 213, 361, EHA 415, MN 380, 381, 382, 385, 386, 387, MT 331. Capstone course for IOM students. Application of material presented.
490. **SPECIAL PROBLEMS (1-10).** Pr., COI, junior standing. May be repeated. Investigation and research into problems with special interest for the student.
496. **READINGS IN MANAGEMENT (5).** Pr., MN 310, junior standing. Readings from prominent periodicals and journals in management theories, practices, and functions.

ADVANCED UNDERGRADUATE AND GRADUATE

541. **PERSONNEL AND ORGANIZATIONAL RESEARCH I (4).** Pr., MN 274 or equivalent, MN 346, 442, junior standing. Research methods used in personnel and labor relations.

- 545. **PERSONNEL AND ORGANIZATIONAL RESEARCH II (3).** Pr., MN 541 and junior standing. Reading, analyzing, and conducting limited research studies in personnel and organizational problems.
- 550. **PERSONNEL SELECTION AND PLACEMENT (3).** Pr., MN 274 or PG 315 or equivalent, MN 442, junior standing. Factors involved in developing an effective system for selecting, classifying, and placing personnel.
- 551. **MANPOWER PLANNING, DEVELOPMENT, AND APPRAISAL (3).** Pr., MN 442, junior standing. Theory and practice plus design of managerial systems in these specialties.
- 560. **A SURVEY OF CURRENT TECHNOLOGIES IN MIS (5).** Pr., MN 382 or equivalent. Recent computer related technologies that impact the effective design, delivery, and use of application software in MIS.
- 583. **DATA BASE MANAGEMENT SYSTEMS (5).** Pr., MN 307, junior standing. Business applications software in a data base environment, complex data and file structures, systems design consideration of global and distributed data bases.

GRADUATE

- 510. **THE PROCESS OF MANAGEMENT (5).** Pr., for non-business students, consent of Director of the MBA Program, School of Business. Accelerated course in management concepts, production functions and practices.
- 570. **FOUNDATIONS OF STATISTICS (4).** Pr., MN 274 and for non-business students, consent of the Director of the MBA Program, School of Business. An accelerated course designed to provide beginning MBA students with a foundation in statistical concepts, techniques and applications.
- 581. **DATA PROCESSING AND INFORMATION SYSTEMS (3).** Pr., for non-business students, consent of Director of the MBA Program, School of Business. Accelerated course in computer programming, data processing, and information systems.
- 600. **COMPUTERS AND INFORMATION SYSTEMS IN MANAGEMENT (5).** Pr., MN 510, 581 or equivalent or COI. In-depth analysis of computing, data processing, information systems in complex organizations.
- 605. **BEHAVIOR IN ORGANIZATIONS (5).** Pr., MN 510 or equivalent and, for non-business students, consent of Director of the MBA program, School of Business. Advanced study of human relations in individual group interactions within the environment of business organizations. Emphasis on research literature in the field.
- 606. **MANAGEMENT PROBLEMS (5).** Pr., ACF 610, 663, EC 656, MN 605, 681 and MT 631, and, for non-business students, consent of the Director of the MBA program, School of Business. Basic administrative and managerial problems in business, industry, and other organizations. Management of an organization from a general manager's perspective. Interrelations between environment, organization, strategy, policies, and the execution of plans are emphasized.
- 607. **MANAGERIAL ECONOMICS (5).** Pr., completion of prerequisites for graduate study in Business or COI. Decision theory and criteria for decision-making concerning output, pricing, capital budgeting, scale of operations, investment and inventory control. Attention is also given to concepts of profits, production and cost functions.
- 608. **HUMAN RESOURCE MANAGEMENT (5).** Pr., MN 442 or COI. Advanced personnel and human resource management.
- 610. **MULTINATIONAL BUSINESS MANAGEMENT (5).** Pr., completion of prerequisites for graduate study in Business. Management of the multinational enterprise which engages in direct foreign investment.
- 640. **ADVANCED ORGANIZATION THEORY (5).** Pr., MN 510. Traditional and contemporary organization theories with emphasis on current research and controversy.
- 647. **MATERIALS MANAGEMENT (5).** Pr., MN 510, 570, or equivalent. Control of manufacturing operations, forecasting, aggregate production and inventory planning, capacity planning and control; shop floor controls.
- 649. **OPERATIONS MANAGEMENT (5).** Pr., MN 510, 581. Detailed study of techniques related to capital investments, design and implementation of operating systems and management of production and inventory systems.
- 650. **SEMINAR (1-10).** Pr., MN 510, 581, COI. For those students engaged in intensive study and analysis of management problems.
- 666. **INFORMATION SYSTEMS ANALYSIS AND DESIGN (5).** Pr., MN 581 or equivalent. General systems theory, information system documentation, macro and micro information systems analysis.
- 681. **DETERMINISTIC QUANTITATIVE METHODS (3).** Pr., MN 581 or equivalent, and, for non-business students, consent of the Director of the MBA program, School of Business. (Same as ACF 681.) Deterministic quantitative methods for business applications.
- 682. **STOCHASTIC QUANTITATIVE METHODS (3).** Pr., MN 581 or equivalent, and, for non-business students, consent of the Director of the MBA program, School of Business. (Same as ACF 682.) Various quantitative methods applied to management decision-making under conditions of risk and uncertainty.
- 683. **ADVANCED DATA BASE MANAGEMENT SYSTEMS (5).** Pr., MN 583 or equivalent. A continuation of MN 583.
- 688. **ADVANCED MANAGEMENT INFORMATION SYSTEMS AND DECISION SUPPORT SYSTEMS (5).** Pr., MN 560, 583, 666, and 689. Problems of advanced analysis and design and implementation of MIS and DSS in organizations.
- 689. **INFORMATION RESOURCE MANAGEMENT (5).** Pr., MN 307, MN 581 or equivalent. Management of information systems resources, unique management problems in a computer information systems environment.
- 690. **SPECIAL PROBLEMS (1-5).** Pr., MN 510, 581 or equivalent, completion of 10 hours of 600-level management courses, and COI. Variable content in the management area.

896. **READINGS IN MANAGEMENT (5).** Pr., MN 510. General management theories, practices, and functions in industry and business. Also, covers the role of personnel management and human relations.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** Pr., COI.

INDUSTRIAL RELATIONS

ADVANCED UNDERGRADUATE AND GRADUATE

500. **LABOR RELATIONS (5).** Pr., junior standing. General survey of the development of collective bargaining, major provisions of labor law, and bargaining issues of craft and industrial unions.
501. **LABOR RELATIONS LAW (5).** Pr., MN 500, junior standing. Analysis of background, content, and significance of industrial relations law.
502. **LABOR-MANAGEMENT NEGOTIATION (4).** Pr., MN 500, junior standing. Bargaining issues, preparation for contract negotiation, and simulated bargaining sessions.
503. **LABOR ARBITRATION (3).** Pr., MN 500, junior standing. Interest and grievance arbitration of Labor-Management issues. Case studies emphasized.
517. **LABOR RELATIONS IN PUBLIC ORGANIZATIONS (3).** Pr., junior standing. The background, legal and constitutional aspects and management of group negotiations and collective bargaining in public employment. (Same as PO 517.)
546. **PERSONNEL ADMINISTRATION LEGISLATION (4).** Pr., MN 442, junior standing. Legal aspects of personnel administration activities.
554. **MULTINATIONAL NEGOTIATION AND INTERNATIONAL LABOR (3).** Pr., MN 500 or MN 410, junior standing. Variations among nations in the structure and government of trade unions, their political and religious ties, and other factors that influence multinational bargaining. Emphasis on industrialized nations.

GRADUATE

644. **COLLECTIVE BARGAINING AND ARBITRATION (5).** Pr., MN 500 or COI. The evolution and development of union-management relationships and the process of collective bargaining and arbitration.

Marketing and Transportation (MT)

Professors Baker, Durand, Horton, and Lambert
Associate Professors Adams, Guffey, *Acting Head*, Harris, and Henley
Assistant Professors Laumer, Little, Raman, and Smith
Instructor McNeal

LEGAL ENVIRONMENT

241. **BUSINESS LAW I (4).** Pr., sophomore standing. Introduction to law, torts, contracts, agency and personal property.
242. **BUSINESS LAW II (4).** Pr., MT 241. Legal principles concerning real property, sales, negotiable instruments, partnerships, and corporations.
255. **LEGAL AND SOCIAL ENVIRONMENT OF BUSINESS (4).** Legal and social environment for business operation with emphasis on contemporary issues.
344. **ENVIRONMENTAL LAW (4).** Pr., junior standing. Federal, State, and local law on conservation and regulation of environmental matters.

GRADUATE

605. **SOCIAL AND LEGAL ENVIRONMENT OF BUSINESS (3).** Pr., EC 501, and, for non-business students, consent of Director of the MBA program, School of Business. The influence of the social, legal, political and economic environment on business.

MARKETING

331. **PRINCIPLES OF MARKETING (5).** Pr., EC 202 or AEC 202 and junior standing. A general survey of the field of marketing covering marketing channels, functions, methods and institutions.
332. **MARKETING COMMUNICATION MANAGEMENT (5).** Pr., MT 331, junior standing, not open to marketing majors. Credit cannot be received for both MT 332 and MT 432. An examination of the principles and applications of promotion in marketing.
333. **MERCHANDISING MANAGEMENT (5).** Pr., MT 331, junior standing, not open to marketing majors. Credit cannot be received for both MT 333 and MT 433. An examination and application of retail merchandising management concepts, principles, and fundamentals.
336. **QUANTITATIVE ANALYSIS IN MARKETING (5).** Pr., MN 207, 274, MT 331, MH 161, 169, and junior standing. An examination of the role of quantitative methods in implementing marketing strategy.

337. **FUNDAMENTALS OF SALESMANSHIP (5).** Pr., MT 331, and junior standing. Knowledge of buyer behavior and skill requirements necessary for successful selling; the sales process; business and social responsibilities of salespersons.
341. **BUYER BEHAVIOR (5).** Pr., MT 331, PG 211, and junior standing. Analysis of the buying process as it is affected by environmental and institutional forces and development of market strategies which recognize these factors.
400. **STUDENT INTERNSHIP PROGRAM (1-10).** Pr., junior standing and selection by the committee directing the School of Business Intern Program. Credit hours are not applicable as departmental electives.
432. **PROMOTIONAL STRATEGY (5).** Pr., MT 331, 336, 341, and junior standing. Problems of persuasive marketing strategy, promotional objectives, methods of implementing these objectives, and the approaches by which the methods might be blended.
433. **RETAIL STORE MANAGEMENT (5).** Pr., MT 331, 336, 341, and junior standing. Principles and practices in the scientific operation of the retail store. Store location, layout, buying, pricing, and merchandise control.
434. **PURCHASING (5).** Pr., MT 331. Objectives, control, and the direction of industrial purchasing.
436. **MARKETING RESEARCH METHODOLOGY (5).** Pr., MT 331, 336, 341, and junior standing. Methods of scientific research in the field of marketing and their application to the solution of marketing problems.
437. **SALES MANAGEMENT (5).** Pr., MT 331, 336, 341, and junior standing. Principles and practices of sound organization and administration of sales organization. Includes consideration of: sales department organization, selecting, training, compensating, and supervising sales planning, setting up sales territories and quotas.
438. **MARKETING CHANNEL SYSTEMS (5).** Pr., MT 331, 341 and junior standing. The nature and role of marketing channels. Major marketing strategy problems such as designing channel objectives and constraints, distinguishing major channel alternatives, and motivating, evaluating, and controlling channel members.
440. **INTERNATIONAL MARKETING (5).** Pr., MT 331, 341, completion of freshman math requirement, and junior standing. Adapting the marketing process of the domestic firm to international operations and the institutional structure that exists to service foreign markets and the practice of marketing administration by firms operating within these markets.
470. **HONORS THESIS (1-6).** Pr., open only to persons in the University Honors Program and with consent of the student's Honors Adviser.
490. **SPECIAL PROBLEMS IN MARKETING (1-10).** Pr., MT 331 and senior standing. Qualified students conduct investigations of special problems in Marketing. (May be repeated for a maximum of 10 hours credit.)
498. **MARKETING STRATEGY (5).** Pr., MT 331, 336, 341, 436 and completion of all departmental electives. An integrative capstone course for marketing majors.

ADVANCED UNDERGRADUATE AND GRADUATE

581. **SPECIAL STUDIES IN MARKETING RESEARCH (5).** Pr., COI, MT 336, 341, 436; for graduate students, COI and MT 531 or equivalent. Specialized indepth study and research projects within a particular subject area.
582. **SPECIAL STUDIES IN RETAILING/MERCHANDISING (5).** Pr., COI, MT 336, 341, 433, 436; for graduate students, COI, and MT 531 or equivalent. Specialized indepth study and research projects within a particular subject area.
583. **SPECIAL STUDIES IN PROMOTION (5).** Pr., COI, MT 336, 341, 432, 436; for graduate students, COI, and MT 531 or equivalent. Specialized indepth study and research projects within a particular subject area.

GRADUATE

531. **SURVEY OF MARKETING MANAGEMENT (5).** Pr., EC 501 and, for non-business students, consent of Director of the MBA program, School of Business. An accelerated course in marketing concepts and practices.
631. **MARKETING MANAGEMENT (5).** Pr., all foundation courses, and for non-business students, consent of Director of the MBA program, School of Business. Indepth analysis of concepts and techniques pertinent to executive decision-making in marketing.
632. **MARKETING COMMUNICATIONS (5).** Pr., MT 631. A managerial perspective of the marketing communications process.
636. **MARKETING RESEARCH: METHODOLOGY AND APPLICATIONS (5).** Pr., MN 570, MT 631. An examination of accepted marketing research techniques with emphasis on research design, implementation, and data analysis from the point of view of marketing management.
641. **BUYER BEHAVIOR (5).** Pr., MT 631. Analysis of the major psychological, sociological, and organizational behavior concepts involved in consumer and industrial buyer behavior.
690. **SPECIAL PROBLEMS (1-5).** Variable content in marketing.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**

TRANSPORTATION AND PHYSICAL DISTRIBUTION

372. **ECONOMICS OF TRANSPORTATION (5).** Pr., EC 200 and junior standing. The development of systems of transportation. Analysis of rates and their effects upon commerce and industry. Government regulation of transportation agencies.

- 400. **STUDENT INTERNSHIP PROGRAM (1-10).** Pr., junior standing and selection by the committee directing the School of Business Intern Program. Credit hours are not applicable as departmental electives.
- 470. **HONORS THESIS (1-6).** Pr., open only to persons in the University Honors Program and with consent of the student's Honors Adviser.
- 473. **PHYSICAL DISTRIBUTION MANAGEMENT (5).** Pr., MT 336 and junior standing. Fundamentals of physical distribution activities and their interrelationships in the management of the distribution process.
- 474. **INDUSTRIAL TRAFFIC MANAGEMENT (5).** Pr., MT 372. Problems and policies involved in the traffic management function of the industrial firm.
- 475. **TRANSPORTATION AND REGULATED INDUSTRIES (5).** Pr., MT 372 or COI and junior standing. Economic, legislative, and administrative problems related to regulation of transportation and utility rates and services.
- 476. **TRANSPORT ENTERPRISE MANAGEMENT (5).** Pr., MT 372, 475, or COI and junior standing. Problems and policies in the management and administration of transport enterprises of different modal types, primarily air, rail, and motor.
- 477. **BUSINESS LOGISTICS (5).** Pr., MN 274. Problems and analysis in the design and management of logistics systems.
- 484. **SPECIAL STUDIES IN TRANSPORTATION/LOGISTICS (5).** Pr., MT 372, and two from 473, 475, 476, and 477. Specialized indepth study and research projects within a particular subject area.
- 490. **SPECIAL PROBLEMS IN TRANSPORTATION (1-10).** Pr., MT 372 and senior standing. Qualified students conduct investigations of special problems in Transportation. (May be repeated for a maximum of 10 hours credit.)

GRADUATE

- 671. **LOGISTICS MANAGEMENT (5).** Pr., EC 501, MN 570 or their equivalents. Analysis of major logistics elements within the total system of the firm. A problem-oriented approach is employed in developing a managerial perspective.
- 672. **TRANSPORT ECONOMICS AND PUBLIC POLICY (5).** Pr., EC 501 or equivalent. An examination of the U.S. transport system and an analysis of public policy issues regarding regulatory objectives and efficiency of resource use in transportation.
- 690. **SPECIAL PROBLEMS (1-5).** Variable content in transportation.
- 699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**

Materials Engineering (MTL)

Professors Budenstein, Hall, and Jemian
 Alumni Associate Professor Chin, *Chairman*
 Associate Professor Wilcox
 Assistant Professors Hong and Jang

Responsibility for this curriculum, which is described on page 155, rests with the interdisciplinary Materials Engineering Curriculum Committee. Questions should be directed to the Department of Mechanical Engineering which administers the program.

General Curriculum, GC, students (those with undeclared majors) may enroll only with departmental consent.

- 202. **ENGINEERING MATERIALS SCIENCE — STRUCTURE (3).** Pr., CH 103, PS 220 or 205. Theories and properties of crystalline and amorphous materials. Bonding, crystal classes, phase equilibrium relationships, diffusion, and phase transformations. (Same course as ME 202.)
- 304. **ENGINEERING MATERIALS SCIENCE — PROPERTIES (3).** Pr., MTL 202, ME 207. Relationships between structure and properties and the effects of environment. Mechanical properties, plasticity of single and polycrystalline materials and properties of composite materials. (Same course as ME 304.)
- 335. **ENGINEERING MATERIALS SCIENCE — PHYSICAL METALLURGY (4).** LEC. 3, LAB. 3. Pr., MTL 304. Relations between structure and properties of metals. Melting and solidification, crystal structure, dislocation and imperfection theories, alloying, deformation, and transformations. (Same course as ME 335.)
- 336. **PHYSICAL ANALYSIS OF MATERIALS I (4).** LEC. 3, LAB. 3. Pr., MTL 335. The analysis and interpretation of the structures of materials using optical techniques. Specific physical properties will be measured. Samples will be prepared and processed by the students. (Same course as ME 336.)
- 337. **PHYSICAL ANALYSIS OF MATERIALS II (4).** LEC. 3, LAB. 3. Pr., MTL 336 and ME 308. The analysis and interpretation of the structures and properties of materials using special techniques. Diffraction, radiography and various non-destructive test procedures will be employed. (Same course as ME 337.)
- 338. **PHASE DIAGRAMS (4).** Pr., MTL 335. Methods of representing and interpreting phase equilibria. Binary and multicomponent systems. Simpler temperature-composition systems and more complex temperature-pressure-composition systems. Major emphasis on applications. Minor emphasis on phase diagram determination and thermodynamics. (Same course as ME 338.)

435. **PHYSICAL ANALYSIS OF MATERIALS III (4).** LEC. 3, LAB. 3. Pr., MTL 337. The evaluation of microscopic structural features, anisotropic materials properties and the detection and interpretation of flaws. Microscopy, radiography and other non-destructive test methods will be employed. (Same course as ME 435.)
445. **TRANSFORMATIONS IN CONDENSED PHASES (4).** LEC. 3, LAB. 3. Pr., MTL 337, MTL 425, and MTL 536. Important transformations in both metallic and non-metallic materials with crystalline or glass structures. Structures, mechanisms, distinctive characteristics and applications will be studied. Selected transformations will be studied in the laboratory. (Same course as ME 445.)
446. **THEORETICAL MATERIALS ENGINEERING (3).** Pr., MTL 575, MTL 570, Coreq., MTL 513. The physical properties of materials in relation to modern theories. (Same course as ME 446.)
447. **MECHANICS OF ENGINEERING MATERIALS (4).** LEC. 3, LAB. 3. Pr., MTL 516 and MTL 536. The mechanical properties in relation to structural features of alloys, plastics, ceramic materials and composites under static, dynamic and cyclic service and test conditions. Conditions for the attainment of optimum properties and behavior will be emphasized. (Same course as ME 447.)
448. **INTRODUCTION TO CERAMICS (3).** Pr., MTL 335. The engineering applications and design principles of important ceramic materials will be studied with particular attention directed to the structure-property relationships. Both glassy and crystalline ceramic materials will be included. (Same as ME 448.)
479. **HONORS THESIS (1-6).** Pr., COI and department head approval. Individual student endeavor consisting of directed research and writing of honors thesis. (MTL Honors Program students only. May be repeated once for a maximum of 6 total credit hours.)

ADVANCED UNDERGRADUATE AND GRADUATE

513. **INTRODUCTION TO X-RAY CRYSTALLOGRAPHY (5).** LEC. 4, LAB. 3. Pr., MTL 435. Principles of crystallography, the reciprocal lattice, theory of x-ray diffraction, and the powder, Laue, and diffractometer methods. (Same course as PS 513.)
515. **POLYMER TECHNOLOGY I (4).** LEC. 3, LAB. 3. Pr., CH 507, Coreq., CH 508. Important aspects of polymer science, connection between chemical structure and important properties of modern plastics and synthetic structural materials, the common methods of fabrication of these into articles and the basic chemistry behind their manufacture.
516. **POLYMER TECHNOLOGY II (3).** LEC. 3. Pr., MTL 515 or TE 424. Continuation of MTL 515. Study of polymerization and condensation polymers. Modes of fabrication, special use selection requirements, and study of a number of commercially available materials and their areas of use.
536. **ENGINEERING MATERIALS SCIENCE — FERROUS METALLURGY (3).** Pr., MTL 335. Design of ferrous metals following modern theory and practice. Hardenability, alloying deformation, and special purpose steels. (Same course as ME 536.)
550. **THERMODYNAMICS OF MATERIALS SYSTEMS (4).** Pr., ME 301 and MTL 338. The laws of thermodynamics applied to the stability of materials phases, crystal imperfections, solubility, oxidation, surface and interfacial energy, and transformations. (Same course as ME 550.)
570. **ELECTRICAL PROPERTIES OF MATERIALS (3).** Pr., MTL 337, and EE 263. Studies of the electrical properties of materials with emphasis on semiconductors.
575. **RATE PROCESSES IN MATERIALS (3).** Pr., CH 508, or COI and junior standing. Diffusion in the gas, liquid and solid phases and the fundamentals of chemical reaction kinetics pertinent to the crystallization and transformation of materials.

GHUSAYNI - Bad News
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Mathematics (MH)

Professors Wall, Head, Ball, J. Brown, Burton, Butz, B. Fitzpatrick, Gruenhage, Heath, Hill, Holmes, Hudson, Kozlowski, K. Kuperberg, W. Kuperberg, Lindner, Reed, Rogers, and Zenor

Associate Professors S. Brown, Ford, Grone, Hinrichsen, Hoffman, Johnson, Minc, Pate, Robinson, Smith, Transue, Uhlig, Young, and Zalik

Assistant Professors Albrecht, Baldwin, Beaudoin, Currie, DeSouza, Fleming, M. Fitzpatrick,* Halchin, Henderson, Kennedy, Leonard, McGwier, Motte, Rodger, Stuckwisch, Teirlinck, and Veeh

Instructors Bennett,* S. J. Brown,* Fu, Gittings,* Glover, Guffey, Murphy, J. S. Rogers,* Turner,* and Webber

100. **MATHEMATICAL INSIGHTS (5).** For students in the arts or humanities. The purpose of this course is to give such students insight into the nature of mathematics by engaging them in mathematical thought processes within a suitable elementary framework. Prior credit for any other University mathematics course precludes credit for this course.
140. **COLLEGE ALGEBRA (5).** Pr., high school geometry, second year high school algebra or departmental approval. ** Algebraic techniques, coordinate geometry, functions and relations and their graphs, and common logarithms. A preparatory course for MH 151, MH 160 and MH 161. However, credit is not allowed for both MH 140 and MH 160.

151. **FINITE MATHEMATICS (5).** Pr., MH 140 or 160. Selections from elementary combinatorial analysis, probability theory, linear algebra, linear programming. Not open, except by special permission of the Department of Mathematics, to students in Engineering or the Mathematics or Physics majors. Credit is not allowed for both MH 151 and MH 169.
155. **ANALYTIC GEOMETRY (5).** Pr., MH 160 or equivalent. Plane and solid analytic geometry. Lines, planes, circles, spheres, vectors, conics, change of coordinates, polar coordinates, parametric equations, curve sketching.
160. **PRE-CALCULUS WITH TRIGONOMETRY (5).** Pr., high school geometry, second year high school algebra or departmental approval. ** The basic analytic and geometric properties of the algebraic and trigonometric functions with heavy emphasis on the latter. A preparatory course for the calculus sequence. Students who need a review of algebraic techniques should take MH 140. However, credit is not allowed for both MH 140 and MH 160.
161. **ANALYTIC GEOMETRY AND CALCULUS (5).** Pr., MH 140 or 160. Limits, the derivative, applications of the derivative, antiderivatives; the conic sections.
- 162-163. **ANALYTIC GEOMETRY AND CALCULUS (5-5).** Pr., MH 160 and 161. Integrals, the fundamental theorem of calculus, applications of the integral, the calculus of the exponential and logarithmic functions. The calculus of the trigonometric and inverse trigonometric functions, techniques of integration, indeterminate forms, improper integrals.
169. **BUSINESS MATHEMATICS WITH CALCULUS APPLICATIONS (5).** Pr., MH 161. Selections from calculus, elementary combinatorial analysis, probability theory, linear algebra, linear programming with emphasis on business applications. Designed for students in the School of Business and not open, except by special permission of the Department of Mathematics, to students in Engineering or the Mathematics or Physics majors. Credit is not allowed for both MH 151 and MH 169.
- 191-192-193. **CALCULUS FOR ENGINEERING AND SCIENCE (5-5-5).** Pr., MH 160. Plane and solid analytic geometry, real and vector valued functions, limits, derivatives and antiderivatives of algebraic and trigonometric functions. Integrals, the Fundamental Theorem of Calculus, line integrals, potential functions, force fields, and surface integrals. Methods of integration, indeterminate forms, improper integrals.
264. **ANALYTIC GEOMETRY AND CALCULUS (5).** Pr., MH 163. A continuation of MH 161-162-163. Infinite series, partial derivatives, multiple integrals.
265. **LINEAR DIFFERENTIAL EQUATIONS (3).** Coreq., MH 264. First and second-order linear differential equations including the solution of such equations by infinite series.
266. **TOPICS IN LINEAR ALGEBRA (3).** Pr., MH 163. Linear spaces, vector spaces, linear transformations, matrices and determinants. Not open to students who have credit for MH 337, 531 or MH 505 or MH 537.
267. **DISCRETE PROBABILITY (5).** Coreq., MH 161. Designed for students whose fields require a basic knowledge of probability and for those who plan to take upper level courses in probability and statistics. Conditional probability, independence and random variables with emphasis on discrete random variables.
269. **ELEMENTARY DIFFERENTIAL EQUATIONS (5).** Pr., MH 264. Ordinary differential equations with applications. Credit for this course precludes credit for MH 265.
271. **INTRODUCTION TO MATHEMATICAL PROGRAMMING (3).** Coreq., MH 264. Introduction to the organization and characteristics of the digital computer, and to programming in FORTRAN, with applications to problems in algebra and the calculus.
272. **MATHEMATICAL PROGRAMMING AND NUMERICAL ALGORITHMS (3).** Coreq., MH 265 and MH 266. Pr., MH 271. Introduction to numerical methods for solution of ordinary differential equations and systems of linear equations. Further programming practice in FORTRAN.
- 281-282. **ELEMENTARY MATHEMATICS (5-5).** Pr., sophomore standing. These courses provide appropriate mathematical insights for elementary school teachers. Emphasis is on the structure of the number systems, the basic concepts of algebra and informal geometry. Open for credit only to students in Elementary Education, except by special permission of the Department of Mathematics.
294. **CALCULUS FOR ENGINEERING AND SCIENCE (5).** Pr., MH 193. A continuation of MH 191-192-193. Sequences, infinite series introduction to complex variables.
301. **HISTORY OF MATHEMATICS (3).** Pr., MH 163 or departmental approval. The evolution of modern mathematics from its motivational roots in the physical sciences; the lives and contributions of outstanding mathematicians; the parallel development of mathematics and western culture.
- 331-332. **INTRODUCTION TO MODERN ALGEBRA I, II (5-5).** Pr., MH 163. Sets, mapping, the integers, isomorphisms, and homomorphisms; groups, rings, fields, ideals.
337. **INTRODUCTION TO LINEAR ALGEBRA (5).** Pr., MH 163. Matrices; systems of equations; determinants; vector spaces; linear transformations; inner products; unitary, Hermitian, and normal matrices; eigenvalues and eigenvectors; diagonalization of Hermitian matrices. Credit for this course precludes credit for MH 266.
339. **LINEAR PROGRAMMING (5).** Pr., MH 266 or 337. The general linear programming problem; feasible solutions; simplex method; cycling and degeneracy; duality theory; sensitivity analysis; applications.
362. **ENGINEERING MATHEMATICS I (3).** Pr., MH 265. Fourier Series, partial differential equations, special functions.

*Temporary.

**This is a non-credit course for students in some scientific and technical curricula.

371. **DISCRETE MATHEMATICS FOR COMPUTER SCIENCE (3).** Pr., MH 266 or 337. Elementary logic, predicate calculus; sets, binary relations, functions, order relations, induction, recursion; semigroups, monoids, homomorphisms; elements of graph theory. Emphasis on topics applicable in computer science.
479. **HONORS THESIS (3-6).** Pr., Senior status and enrollment in Auburn University Honors Program. May be repeated once for maximum of 6 hours credit.
491. **SPECIAL PROBLEMS (1-5).** Pr., departmental approval, junior standing. An individual problems course. Each student will work under the direction of a staff member on some problem of mutual interest.

ADVANCED UNDERGRADUATE AND GRADUATE

500. **MATHEMATICAL MODELING (5).** Pr., MH 265, 269, or 528; an ability to program in FORTRAN. Introduction to mathematical models and related techniques. Course includes both general principles involving continuous and discrete deterministic problems and a detailed, specific term-project.
501. **THE CALCULUS OF VECTOR FUNCTIONS (3).** Pr., MH 266 or departmental approval. Derivative and integral of vector functions, gradient, divergence, curl, Green's Theorem, Stokes Theorem.
502. **TENSOR ANALYSIS (3).** Pr., MH 264, 501. The Frechet derivative; tensors and tensor valued functions; coordinate transformations; co-variant and contravariant tensors; tangent spaces; differential forms; wedge products of forms; Einstein summation convention (raising and lowering indices); Riemannian metrics.
503. **ENGINEERING MATHEMATICS II (5).** Pr., MH 265. Complex numbers, functions, mappings, residues, contour integration.
505. **MATRIX THEORY AND APPLICATIONS (5).** Pr., MH 266 or 531. Canonical forms, determinants, linear equations, characteristic value problems.
506. **ELEMENTARY PARTIAL DIFFERENTIAL EQUATIONS (3).** Pr., MH 362. First and second order linear partial differential equations with emphasis on the methods of eigenfunction expansions.
508. **ELEMENTS OF NUMERICAL ANALYSIS (5).** Pr., MH 264. The numerical solutions of selected problems arising in calculus and algebra along with the programming techniques.
- 510-511. **CALCULUS OF VARIATIONS I, II (3-3).** Pr., MH 265 or 269. Fundamental concepts of extrema of functions and functionals; the simplest problem of the calculus of variations; first and second variations; generalizations of the simplest problem; sufficient conditions; constrained functionals; the general Lagrange problem; optimal control.
512. **INFORMATION THEORY (5).** Pr., MH 264. An introduction to discrete probability and its applications to coding. The concept of entropy as a measure of information is developed and applied to problems of coding, channel capacity, and error correction.
515. **ALGEBRAIC CODING THEORY I (5).** Pr., MH 266 or 337. Binary codes, linear codes, cyclic codes, Hamming codes, BCH codes; maximum likelihood decoding; error detection and correction; coset decoding.
516. **ALGEBRAIC CODING THEORY II (5).** Pr., MH 515. Theory of and implementable algorithms for codes of current practical and theoretical importance. Generalized BCH codes, Reed-Muller codes, Kerdock and Preparata codes, Reed-Solomon codes, quadratic residue codes, Justesen and concatenated codes, convolution codes.
- 520-521-522. **ANALYSIS I, II, III (5-5-5).** Pr., MH 264. The real number system, theorems concerning number sets, sequences, graphs of functions; Riemann-Stieltjes integration, continuity, the derivative and functions of bounded variation; functions whose domains are in Euclidean spaces.
524. **FOURIER ANALYSIS (5).** Pr., MH 521; an ability to program FORTRAN. Convergence and oscillation theorems for Fourier Series. Gibbs phenomenon. Fourier transform. Fast Fourier transform.
528. **SYSTEMS OF DIFFERENTIAL EQUATIONS AND APPLICATIONS (5).** Pr., MH 265 and 266 or equivalent. Linear systems of differential equations, stability, phase portraits; non-linear systems, linearization, qualitative properties of orbits, Poincare-Bendixson Theorem; numerical methods; applications to various disciplines.
531. **INTRODUCTION TO MODERN ALGEBRA III (5).** Pr., MH 332. A continuation of MH 331-332.
537. **LINEAR ALGEBRA (5).** Pr., MH 266 and 332. Linear transformations, matrix algebra, finite-dimensional vector spaces.
- 541-542. **GEOMETRY, A MODERN VIEW I, II (5-5).** Pr., MH 163. A development of geometry using the real number system and measurement as proposed by G. D. Birkhoff. The course moves rapidly, with definitions and proofs, through the foundations of geometry and into the main body of geometric theory.
543. **LINEAR GEOMETRY (5).** Pr., MH 163. Transformations in projective, affine, and Euclidean planes.
544. **COMBINATORIAL GEOMETRY IN THE PLANE (5).** Pr., MH 163. Helly's and related theorems.
- 550-551. **METRIC SPACES (3-3).** Pr., MH 521 or departmental approval. The elementary properties of metric spaces with special attention to the line and the plane.
560. **INTRODUCTION TO NUMERICAL ANALYSIS (5).** Pr., MH 265, 269 or 528; an ability to program in FORTRAN. Polynomial approximation, numerical differentiation and integration, solution of ordinary differential equations (initial value problems) error analysis.
561. **NUMERICAL MATRIX ANALYSIS I (5).** Pr., MH 266 or 337 or 531; an ability to program in FORTRAN. Direct and iterative numerical solutions of systems of linear equations, solutions of boundary value problems, numerical calculations of eigenvalues and eigenvectors, error analysis.

562. **NUMERICAL MATRIX ANALYSIS II (5).** Pr., MH 561 or COI. An indepth study of at least one of the following topics: discretisation matrices for partial differential equations and boundary value problems, sparse matrices, refinements for the QR-algorithm, symmetric eigenvalue problem, singular value decomposition, pseudo-inverses, simplex method, matrix algorithms for vector computers.
567. **PROBABILITY THEORY (5).** Pr., MH 264. An introduction to probability. Random variables, discrete and absolutely continuous distributions. The Poisson process. Expectation and conditional expectation. Moments and moment generating functions. Convergence and limiting distributions. Emphasis on problem solving.
568. **MATHEMATICAL STATISTICS I (5).** Pr., MH 567. An introduction to statistical methods. Estimation and maximum likelihood estimates. Sampling distributions, confidence intervals, hypothesis testing, the likelihood ratio test, sufficiency, completeness, and Rao-Blackwell theorem.
569. **MATHEMATICAL STATISTICS II (5).** Pr., MH 568. Analysis of variance, regression, and least squares. Sequential analysis. Bayesian estimation. Nonparametric methods.
571. **LINEAR OPTIMIZATION (5).** Pr., MH 266 or 337. Simplex algorithm and duality, shortest path, network flow, minimal cost flow, out-of-kilter method, assignment problems, matching, emphasis on both theory and algorithms for applied problems.
573. **ENUMERATION (5).** Pr., MH 264. Permutations and combinations, generating functions, inclusion-exclusion, cycles of permutations, occupancy, partitions, trees, Polya trees.
575. **GRAPH THEORY (5).** Pr., MH 163. Connectivity, traversability, coverings, planarity, colorability, digraphs, algorithms and applications.
577. **COMBINATORIAL DESIGNS (5).** Pr., MH 163. Latin squares, block designs, finite geometries, distinct representatives, difference sets.
579. **EFFICIENT ALGORITHMS FOR COMPUTER PROGRAMS (3).** Pr., knowledge of linear algebra and a computer language. The construction of serial and parallel algorithms to perform various tasks (sorting for instance) is studied using techniques such as recursion, tree search, or divide-and-conquer and using numerous data structures such as heaps, queues, stacks, sets, binary trees and graphs. Of primary concern is the evaluation of the algorithm's efficiency by provably intractable problems (and how to recognize others) are also studied.
581. **FOUNDATIONS OF GROUP THEORY FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Elements of the theory of groups emphasizing geometric and other examples.
582. **FOUNDATIONS OF STATISTICS FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Discrete probability distributions; introduction to statistical inference.
583. **FOUNDATIONS OF LINEAR ALGEBRA FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Matrix algebra, quadratic forms with emphasis on geometric interpretations in two and three dimensions.
584. **FOUNDATIONS OF NUMBER THEORY FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Divisibility, Diophantine equations, congruences.
585. **FUNDAMENTALS OF ALGEBRA FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Structure of the ring of integers; polynomial rings.
586. **FOUNDATIONS OF NON-EUCLIDEAN GEOMETRY FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. B. L. geometry, hyperbolic geometry, absolute geometry, parallel postulates.
587. **FUNDAMENTALS OF ANALYSIS FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Mathematical analysis with emphasis on basic principles and relationships. Students will develop the material from basic concepts.
- 588-589. **CERTIFICATION MATHEMATICS FOR SECONDARY SCHOOL TEACHERS* (5-5).** Pr., undergraduate major in mathematics and departmental approval. Summer. For secondary school teachers who are working toward Class A certification. Topics will be selected from analysis, algebra and geometry according to the needs and interests of the students enrolled.
591. **TOPICS IN PROBABILITY AND STATISTICS (1-5).** (May be repeated for credit). Pr., MH 567 or COI. A mathematical treatment of certain topics in probability and statistics. Topics will vary from year to year and will be chosen from the following: Applied stochastic process, time series, experimental design, sampling theory, non-parametric methods, and others.

GRADUATE

- 602-603. **CELESTIAL MECHANICS I, II (5-5).** Pr., MH 507 or departmental approval. Elliptic motion, potentials of attracting bodies, numerical integration and differential correction of orbits, lunar theory, theory of perturbations, Lagrange's method and introduction to canonical variables, the disturbing function, artificial satellite orbit theory.
- 607-608-609. **APPLIED MATHEMATICS I, II, III (5-5-5).** Pr., approved graduate standing. Scalar, vector, and dyadic fields; equations governing fields; Helmholtz's and Laplace's equations in curvilinear coordinates; separation of variables; boundary conditions and eigenfunctions; Green's functions.
610. **SPECIAL FUNCTIONS (5).** Pr., departmental approval.
613. **TENSOR ANALYSIS (5).** Pr., departmental approval.

*Not available to majors or graduate students in the area of science or mathematics.

- 620-621-622. REAL ANALYSIS I, II, III (3-3-3).** Pr., departmental approval. Measure and integration, metric spaces, introduction to functional analysis.
- 623-624-625. FUNCTIONS OF A COMPLEX VARIABLE I, II, III (3-3-3).** Pr., departmental approval. Complex numbers, analytic functions, derivatives, Cauchy integral theorem and formulas, Taylor and Laurent series, analytic continuation, residues, maximum principles, Riemann surfaces, conformal mapping, families of analytic functions.
- 628-629. ADVANCED THEORY OF DIFFERENTIAL EQUATIONS (5-5).** Pr., departmental approval. Existence, uniqueness and continuation theorems for ordinary and partial differential equations; nature of solutions. The first quarter will be devoted to ordinary equations, the second to partial differential equations.
- 630-631-632. ABSTRACT ALGEBRA I, II, III (3-3-3).** Pr., departmental approval. Groups, rings, modules, fields.
- 633. THEORY OF GROUPS (5).** Pr., MH 631. Sylow theory, abelian groups, chain conditions.
- 634. THEORY OF RINGS (5).** Pr., MH 632 or departmental approval. Structure of rings, ideals in commutative rings.
- 635. ABELIAN GROUPS (5).** Pr., departmental approval. An axiomatic development of abelian group theory: decomposition theorems, finitely generated groups, rank, divisible groups, pure subgroups, basic subgroups, ulm factors.
- 637-638-639. MATRICES (3-3-3).** Pr., MH 537 or COI. Jordan form, functions of a matrix, spectral theorem, singular values, norms, quadratic forms, field of values, inertia; 639: selected topics of current interest.
- 640-641-642. NORMED LINEAR SPACES (5-5-5).** Pr., departmental approval. Bounded linear transformations and linear functionals on Banach and Hilbert spaces, including conjugate spaces, adjoint operators, self adjoint operators, spectral theory, applications to particular spaces.
- 645-646. LINEAR CONTROL THEORY I, II (5-5).** Pr., MH 265 and 266. Linear control systems, controllability, observability, canonical forms, feedback, pole assignment, realizations, stability analysis for linear systems, stability and control, regulation and tracking, parameter space design, robust controllers, optimal control, computational aspects of control theory.
- 647-648-649. FUNCTIONAL ANALYSIS (5-5-5).** Pr., MH 642 or departmental approval. Topics in the advanced theory of linear functionals and operators on Banach and Hilbert spaces, chosen to lead students into research work in this field.
- 650-651-652. GENERAL TOPOLOGY (5-5-5).** Pr., departmental approval. An axiomatic development of point-set topology: connectivity, compactness, separability, topological equivalence, well-ordering, inner limiting sets, Cartesian products.
- 653. DIMENSION THEORY (5).** Pr., departmental approval. The topological study of dimension in separable metric spaces.
- 654-655-656. POINT-SET TOPOLOGY (5-5-5).** Pr., MH 652. Upper semi-continuous collections, indecomposable continua, metrization problems, inverse limits, other topics.
- 657-658. EUCLIDEAN TOPOLOGY (5-5).** Pr., MH 650. Topology with emphasis on those areas which distinguish among the polyhedra in Euclidean spaces (e.g., Theory of Retracts).
- 661. ADVANCED NUMERICAL ANALYSIS (5).** Pr., MH 561, and 265 or 528. Numerical solution of partial differential equations.
- 664-665-666. PROBABILITY (5-5-5).** Pr., knowledge of Lebesgue integration. Probability measures, random variables, distribution functions (discrete, absolutely continuous, and singular), expectation, characteristic functions (Fourier transforms), independence, limit theorems, convergence to Poisson and normal distributions, central limit theorem, Stochastic processes and Brownian motion, probability measures on metric spaces.
- 670. UNIFORM SPACES (5).** Pr., MH 652 and departmental approval. Uniform spaces, uniform topology, uniformly continuous functions, completions of uniform spaces, other topics.
- 673-674-675. COMBINATORIAL THEORY (5-5-5).** Pr., MH 332. Topics of current interest in combinatorial theory to include enumeration theory, systems of distinct representatives, Latin squares, quasigroups, block designs, Steiner triple systems, Room squares, and finite geometries.
- 680. LINEAR MODELS I (5).** Pr., MH 505 or 537 or 568. A rigorous development of some of the important topics of applied statistics. Analysis of variance, covariance and regression. The multivariate normal distribution.
- 681. LINEAR MODELS II (5).** Pr., MH 680. A continuation of MH 680.
- 682. MULTIVARIATE ANALYSIS (5).** Pr., MH 681. Important topics in multivariate statistical analysis including Hotelling's T^2 distribution and its applications. Discriminant analysis, correlation. Wilk's Lambda criterion and the multivariate analysis of variance.
- 683-684-685. STOCHASTIC PROCESSES (5-5-5).** Pr., MH 567. An introduction to stochastic processes. Markov chains and Markov processes. Renewal theory, stationary processes, spectral properties. Martingales and Brownian motion. Branching processes. Application to queueing theory.
- 689. RESEARCH AND SPECIAL PROJECT IN PROBABILITY AND STATISTICS. (CREDIT TO BE ARRANGED.)** (May be repeated for credit.)
- 691. DIRECTED READING IN ALGEBRA. (CREDIT TO BE ARRANGED.)** Pr., 10 hours of 600 courses in the area.
- 692. DIRECTED READING IN ANALYSIS. (CREDIT TO BE ARRANGED.)** Pr., 10 hours of 600 courses in the area.

693. DIRECTED READING IN APPLIED MATHEMATICS. (CREDIT TO BE ARRANGED.) Pr., 10 hours of 600 courses in the area.
694. DIRECTED READING IN GEOMETRY. (CREDIT TO BE ARRANGED.) Pr., 10 hours of 600 courses in the area.
695. DIRECTED READING IN TOPOLOGY. (CREDIT TO BE ARRANGED.) Pr., 10 hours of 600 courses in the area.
696. DIRECTED READING IN MATRIX THEORY. (CREDIT TO BE ARRANGED.) Pr., 10 hours of 600 courses in the area.
697. DIRECTED READING IN NUMERICAL ANALYSIS. (CREDIT TO BE ARRANGED.) Pr., 10 hours of 600 courses in the area.
698. DIRECTED READING IN LOGIC AND SET THEORY. (CREDIT TO BE ARRANGED.) Pr., 10 hours of 600 courses in the area.
699. RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.) May be repeated for credit.
799. RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)

Mechanical Engineering (ME)

Professors Crocker, *Head*, Barbin, Beckett, Bussell, Dyer, Goodling,
Jemian, Jones, Maples, Penrod, Reece, Shaw, and Swinson
Alumni Associate Professor Chin
Associate Professors Fluker, Madsen, Siginer, Turner, Wilcox, and Yu
Assistant Professors Hong and Jang

General Curriculum, GC, students (those with undeclared majors) may enroll only with departmental consent.

202. ENGINEERING MATERIALS SCIENCE — STRUCTURE (3). Pr., CH 103, PS 220 or 205. Theories and structures of crystalline and amorphous materials. Bonding, crystal classes, phase equilibrium relationships, diffusion and phase transformations. (Same course as MTL 202.)
205. APPLIED MECHANICS — STATICS (4). Pr., PS 220; Coreq., MH 264. Resolution and composition of forces; equilibrium of force systems; friction; second moments.
207. STRENGTH OF MATERIALS I (3). Pr., ME 205 and MH 264; Coreq., MH 265. Fundamentals of stress and strain; stress-strain relations; temperature effects; bar with axial force; thinwall cylinders; torsion.
211. ENGINEERING METHODS (2). LEC. 1, LAB. 3. Coreq., PS 222. Presentation and practices in use of techniques of analysis of engineering models.
301. THERMODYNAMICS I (4). Pr., MH 264 and PS 221. Laws of thermodynamics; energy transformations; properties and relationships among properties; equations of state and simple processes and cycles.
302. THERMODYNAMICS II (3). Pr., ME 301. Thermodynamic analysis of real and ideal cycles, and concepts of compressible fluid flow.
303. THERMODYNAMICS III (3). Pr., ME 301. Property determination, Maxwell's relations, thermodynamics of mixtures, combustion, and chemical equilibrium.
304. ENGINEERING MATERIALS SCIENCE — PROPERTIES (3). Pr., ME 202, 207. Relationships between structure and properties and the effects of environment. Mechanical properties, plasticity of single and poly-crystals, and properties of composite materials. (Same course as MTL 304.)
308. COMPUTATION LABORATORY (3). LEC. 2, LAB. 3. Pr., MH 265. Application of analog and digital programming in Mechanical Engineering.
309. CORRELATIVE EXPERIMENTAL MECHANICS (2). LEC. 1, LAB. 3. Pr., ME 207. Theories of failure; determination of stress fields by experimental techniques; introduction to photoelasticity; strain gages; relation of uniaxial test data to failure envelopes.
310. THERMODYNAMICS (5). Winter. Pr., MH 163 and PS 206 or equivalent. Gases and vapors; cycles; mass and heat transfer. Open to non-Mechanical Engineering students only.
316. STRENGTH OF MATERIALS II (4). LEC. 3, LAB. 3. Pr., ME 207, 309. Applications of theory with ample experimental verification; structures consisting of bars subjected to axial force and/or torsion; spherical cylindrical thin wall pressure vessels; beams and long columns.
321. DYNAMICS I (4). Pr., ME 205; Coreq., MH 265. Kinematics of points, lines, and rigid bodies; relative motion; coordinate transformations; kinetics; conservation of energy and momentum.
322. DYNAMICS II (4). Pr., ME 211 and 321. Matrix methods in kinematics; introduction to celestial mechanics; equations of motion; the inertia tensor; gyroscopic motion.
323. DYNAMICS OF MACHINES (4). LEC. 3, LAB. 3. Pr., ME 207, 308, 322. Analysis of rotating systems. Dynamic force analysis of mechanisms and complexes of mechanisms. Oscillating systems.

*Not available to majors or graduate students in the area of science or mathematics.

335. **ENGINEERING MATERIALS SCIENCE — PHYSICAL METALLURGY (4).** LEC. 3, LAB. 3. Pr., ME 304. Relations between structure and properties of metals. Melting and solidification, crystal structure, dislocation and imperfection theories, alloying, deformation, and transformations. (Same course as MTL 335.)
336. **PHYSICAL ANALYSIS OF MATERIALS I (4).** LEC. 3, LAB. 3. Pr., ME 338. The analysis and interpretation of the structures of materials using optical techniques. Specific physical properties will be measured. Samples will be prepared and processed by the students. (Same course as MTL 336.)
337. **PHYSICAL ANALYSIS OF MATERIALS II (4).** LEC. 3, LAB. 3. Pr., ME 308, 336. The analysis and interpretation of the structures and properties of materials using special techniques. Diffraction, radiography and various non-destructive test procedures will be employed. (Same course as MTL 337.)
338. **PHASE DIAGRAMS (4).** LEC. 3, LAB. 3. Pr., ME 335. Methods of representing and interpreting phase equilibria. Binary and multicomponent systems. Simpler temperature-composition systems and more complex temperature-pressure-composition systems. Major emphasis on applications. Minor emphasis on phase diagram determination and thermodynamics. (Same course as MTL 338.)
340. **FLUID MECHANICS I (3).** Pr., ME 301 and 321; Coreq., ME 207. Fluid properties; fluid statics; fluid kinematics; integral forms of conservation laws — applications to exterior and interior flows; dimensional analysis.
341. **FLUID MECHANICS II (4).** Pr., ME 207 and 340; Coreq., ME 302, 322. Potential theory; vorticity; stream functions; viscous flow; boundary layers; turbulent flow.
412. **MEASUREMENTS LABORATORY (2).** LEC. 1, LAB. 3. Pr., ME 341, 308 and 303. The theory and practice of engineering measurements; includes treatment of experimental data, report writing, liquid and gaseous flow measurements, temperature, pressure, thermophysical properties.
415. **FLUIDS AND HEAT TRANSFER LABORATORY (2).** LEC. 1, LAB. 3. Pr., ME 412, 341 and 521. A series of experiments which demonstrate fundamental concepts in fluid dynamics and heat transfer will be performed by the student.
420. **THERMAL SYSTEMS LABORATORY (2).** LEC. 1, LAB. 3. Pr., ME 412; Coreq., ME 515. Selected experiments on thermal systems evaluation.
434. **FLUID MECHANICS AND HEAT TRANSFER (5).** Pr., ME 310. Spring. Mechanics of compressible and incompressible fluids; transmission of heat by conduction, convection, and radiation. Open to non-Mechanical Engineering students only.
435. **PHYSICAL ANALYSIS OF MATERIALS III (4).** LEC. 3, LAB. 3. Pr., ME 337. The evaluation of macroscopic structural features, anisotropic materials properties and the detection and interpretation of flaws. Microscopy, radiography and other nondestructive test methods will be employed. (Same course as MTL 435.)
439. **MECHANICAL ENGINEERING DESIGN I (4).** LEC. 3, LAB. 3. Pr., ME 323, 316; Coreq., ME 335, 527. Design of machine elements for static and dynamic stresses with the emphasis on synthesis and creative design.
440. **MECHANICAL ENGINEERING DESIGN II (3).** LEC. 2, LAB. 3. Pr., ME 439, or departmental approval, senior standing. The solution of typical engineering systems problems by group or team effort, requiring the development of skill and co-operation in the use of analysis, synthesis, creative design and optimization.
441. **ENGINEERING SYSTEMS (CREDIT 1-5).** Pr., senior standing and departmental approval. May be taken more than one quarter, but total credit may not exceed 10 quarter hours. Mechanical Engineering design problems requiring the development of skill in the use of analysis, synthesis and creativeness in the design of engineering systems.
442. **COMPUTER AIDED DESIGN (3).** LEC. 2, LAB. 3. Pr., ME 439. The design of components and machines in an interactive computer environment. Utilization of graphics and component design programs as design tools.
444. **DESIGN FOR HAZARD REDUCTION (4).** Pr., ME 207, 321. Relationships of the mechanics of machinery and the properties of materials which lead to the design principles of hazard reduction in machines and machine systems. Open to non-Mechanical Engineering students only.
445. **TRANSFORMATIONS IN CONDENSED PHASES (4).** LEC. 3, LAB. 3. Pr., ME 337, 425, and 536. Important transformations in both metallic and non-metallic materials with crystalline or glass structures. Structures, mechanisms, distinctive characteristics and applications will be studied. Selected transformations will be studied in the laboratory. (Same course as MTL 445.)
446. **THEORETICAL MATERIALS AND ENGINEERING (3).** Pr., CHE 575 and EE 570; Coreq., PS 513. The physical properties of materials in relation to modern theories. (Same course as MTL 446.)
447. **MECHANICS OF ENGINEERING MATERIALS (4).** LEC. 3, LAB. 3. Pr., CH 516, and ME 536. The mechanical properties in relation to structural features of alloys, plastics, ceramic materials and composites under static, dynamic and cyclic service and test conditions. Conditions for the attainment of optimum properties and behavior will be emphasized. (Same course as MTL 447.)
448. **INTRODUCTION TO CERAMICS (3).** Pr., ME 335 and 445. The engineering applications and design principles of important ceramic materials will be studied with particular attention directed to the structure-property relationships. Both glassy and crystalline ceramic materials will be included. (Same course as MTL 448.)
449. **PROFESSIONAL DIAGNOSTIC PROBLEMS (4).** Pr., senior standing in any engineering curriculum or departmental approval. Problems involving interaction of the different engineering science disciplines, with emphasis on engineering design, synthesis, and systems.
450. **SPECIAL PROBLEMS (CREDIT 1-5).** Pr., departmental approval, junior standing. Individual student endeavor under staff supervision involving special problems of an advanced nature. May be taken more than one quarter but total credit may not exceed 10 quarter hours. Maximum any one quarter 5 hours credit.

451. **ADVANCED PROJECTS (3).** LEC. 1, LAB. 6. Pr., ME 341, 521; Coreq., ME 442, and senior standing. Group or individual projects involving both analysis and synthesis, culminating in a formal presentation or report.
479. **HONORS THESIS (1-6).** Pr., COI and departmental head approval. Individual student endeavor consisting of directed research and writing of honors thesis. (ME Honors Program students only. May be repeated once for a maximum of 6 total credit hours.)

ADVANCED UNDERGRADUATE AND GRADUATE

501. **STATISTICAL THERMODYNAMICS (3).** Pr., ME 301 or departmental approval. Fundamental laws of thermodynamics and thermodynamic properties from the microscopic point of view.
502. **INTRODUCTION TO OPTIMAL SYSTEMS (4).** Pr., MH 510. Application of optimal criteria to engineering problems.
503. **SENSITIVITY ANALYSIS (5).** Pr., IE 410 or equivalent and junior standing. Analysis of the sensitivity of performance of a system or process to changes in the parameters of the system.
510. **POWER PLANT SYSTEMS (5).** LEC. 3, LAB. 4. Pr., ME 302, senior standing. Theory, design, performance and applications of power plant systems.
514. **TURBOMACHINES (4).** Pr., ME 341 or departmental approval. Applications of fluid mechanics to turbomachines, such as pumps, compressors, fluid couplings, control devices, gas and steam turbines.
515. **THERMODYNAMICS OF POWER SYSTEMS (4).** Pr., ME 302, 303, 341; Coreq., ME 521 or departmental approval. Design and analysis of static and dynamic thermal power systems.
521. **HEAT TRANSFER (4).** Pr., ME 340, EE 263, MH 265, or departmental approval. Fundamentals of heat transfer by steady and unsteady conduction, radiation and free and forced convection.
522. **TRANSPORT PROCESSES (3).** Pr., ME 521 or departmental approval. Transport processes involving mass, momentum, and energy transfer combined with heat and mass transfer in chemically reacting boundary layers.
523. **INTRODUCTION TO CONTINUUM MECHANICS (4).** Pr., MH 265 or departmental approval. Kinematics of deformation and motion; fundamental laws and field equation of continuum; constitutive equations of various types of materials. Applications to solid and fluid mechanics.
524. **ENERGY UTILIZATION (3).** Pr., ME 521; coreq., ME 515. Overview of energy sources and conversion systems, followed by energy auditing, efficiency improvements and design procedures for minimizing energy utilization in industrial settings.
527. **DYNAMICS OF PHYSICAL SYSTEMS (4).** Pr., ME 211, 323, 340. Motion of systems represented by first and second order differential equations. Transient types and response of physical systems. Transfer functions.
528. **AIR CONDITIONING AND REFRIGERATION (4).** Pr., ME 302, 521. Theory and design of heating, cooling and ventilating systems, and refrigeration systems.
532. **AUTOMATIC CONTROLS (3).** Pr., MH 265, ME 341, 527. Control systems fundamentals. Systems analysis techniques. Applications to machine and process control.
536. **ENGINEERING MATERIALS SCIENCE — FERROUS METALLURGY (3).** Pr., ME 335. Design of ferrous metals following modern theory and practice. Hardenability, alloying deformation, and special purpose steels. (Same course as MTL 536.)
537. **MANUFACTURING PROCESSES AND MATERIALS (5).** Pr., junior standing, ME 335 and departmental approval. Principles and engineering problems involved in the fabrication of materials, in the selection of engineering materials, in tooling and in production methodology.
539. **FINITE ELEMENT ANALYSIS (4).** Pr., ME 316, MH 264, departmental approval. Development of finite element methods with emphasis on Mechanical Engineering applications. Deformable body, thermal and transient problems are considered.
543. **PHOTOELASTIC STRESS AND STRAIN ANALYSIS (3).** Pr., ME 207. Theory of the polariscope; two- and three-dimensional model making and preparation; techniques of data collection and photoelastic models and analysis.
545. **BASIC STRESS ANALYSIS AND DESIGN THEORY (3).** Pr., ME 205. A rational approach to design. Concepts of stress, of strains, relations between stress and strain, differential equations of equilibrium, compatibility equations, and boundary conditions are formulated. Applications in setting up the necessary field equations subject to the boundary conditions will be included.
546. **DESIGNING WITH FINITE ELEMENTS (4).** Pr., ME 308, 316. The finite element technique is developed and applied to find stress solutions for design components. Applications in discrete systems such as truss analysis and application of continuous systems that are in a static state, a steady state, and a time dependent state are included.
547. **DESIGNING EXPERIMENTALLY WITH PHOTOELASTICITY (4).** Pr., ME 316. Development of the theory for photoelasticity. Use of a polariscope and model making. Using this experimental technique in designing load-carrying components. Designing the component boundary shape to minimize the stress field.
550. **THERMODYNAMICS OF MATERIALS SYSTEMS (4).** Pr., ME 301 and 338. The laws of thermodynamics applied to the stability of materials phases, crystal imperfections, solubility, oxidation, surface and interfacial energy, and transformations. (Same course as MTL 550.)

GRADUATE

604. **ADVANCED THERMODYNAMICS I (3).** Pr., ME 303, graduate standing. Classical thermodynamics of reactive and nonreactive systems; applications.
605. **ADVANCED THERMODYNAMICS II (3).** Pr., ME 604. Statistical treatment of the laws and properties of thermodynamic systems, applications.
608. **ADVANCED THERMODYNAMICS III (3).** Pr., ME 605. Thermodynamics of nonequilibrium processes.
620. **HEAT TRANSMISSION — CONDUCTION (3).** Pr., ME 521, MH 362 or departmental approval. Formulations and solutions of steady, steady periodic, and unsteady heat conduction problems.
621. **HEAT TRANSMISSION — CONVECTION (3).** Pr., ME 521. General problems of convection: forced convection heat transfer, free convection, thermodynamic boundary layers, condensing and boiling, heat transfer to liquid metals and analysis of heat exchangers.
622. **HEAT TRANSMISSION — RADIATION (3).** Pr., ME 521. Fundamental laws of radiation, net radiation methods, configuration factors, radiation through absorbing media, solar, terrestrial and celestial radiation, and thermometry and temperature control.
630. **ADVANCED STRENGTH OF MATERIALS (3).** Pr., ME 316, MH 362 or departmental approval. Stress and strain analyses of curved beams and beams on elastic foundations; energy methods; selected topics from the literature; stress and strain analyses in bars of noncircular section subjected to torsion.
631. **THEORY OF ELASTICITY I (3).** Pr., departmental approval. Theory of stress and strain and stress-strain relations. Laws of balance in momentum, moment of momentum, and energy. Solution by tensor stress function and displacement functions.
632. **THEORY OF ELASTICITY II (3).** Pr., ME 631. Continuation of solutions by potential functions. Solutions of two-dimensional problems by Kolosov-Muskhelishvili methods.
633. **EXPERIMENTAL STRESS ANALYSIS (3).** Pr., ME 316. Stress analyses by experimental techniques including transmission and scattered light photoelasticity; strain gages, brittle coatings, photoelastic coatings. Moiré patterns are developed.
634. **ELASTIC STABILITY (3).** Pr., ME 631 or departmental approval. Stability of conservative and nonconservative systems. Buckling of slender bars and thin-walled cross-sections; buckling of plates and shells. Buckling loads by Rayleigh-Ritz, Galerkin, and Kantorovich methods.
635. **INTERMEDIATE DYNAMICS (3).** Pr., MH 362. Dynamics of particles and systems of particles applied to engineering problems. Work and energy, and impulse and momentum principles. LaGrange's equations and Hamilton's principle.
637. **THEORY OF PLATES (3).** Pr., ME 631. Analyses of plates of various shapes under transverse and in-plane loadings with different boundary conditions. Buckling of plates due to in-plane loadings. Introduction to von Karman large deflection theory.
638. **THEORY OF SHELLS (3).** Pr., departmental approval. Introduction to differential geometry. Development of governing equations for shells under arbitrary loading. Shallow shell theory with applications. Asymptotic method for solution of differential equations in shell theory.
639. **VARIATIONAL MECHANICS (3).** Pr., departmental approval. The problem of Bolza, Mayer and LaGrange with fixed and variable end points; Hamilton's principle and LaGrange's equations; energy method; Rayleigh's principle and Rayleigh-Ritz method; Galerkin method; variational methods; applications.
640. **FLUID DYNAMICS (3).** Pr., MH 362 and graduate standing. Navier-Stokes Equations. Exact and approximate solutions. Euler's equations. Continuity. Energy equations. Irrotational flow.
641. **BOUNDARY LAYER THEORY (3).** Pr., ME 640. Hydrodynamic and thermal boundary layers. Prandtl's equations. Integral relations and approximate techniques.
642. **GAS DYNAMICS I (3).** Pr., ME 640. Compressible flow equations; isentropic flow; Fanno line flow; Rayleigh line flow; shock waves, high speed flow; internal and external flows; forces on immersed bodies.
643. **GAS DYNAMICS II (3).** Pr., ME 642 and 605. Continuation of ME 642 with emphasis on real gas effects and non-equilibrium flow.
644. **TURBULENCE (3).** Pr., ME 641. Analysis of wall-affected and free turbulent flows.
660. **STRUCTURE AND PROPERTIES OF SOLIDS (3).** Pr., departmental approval. Denominations of structure are considered, via an interdisciplinary approach, from the viewpoint of providing a fundamental insight with respect to the genesis of selected macroscopic properties.
661. **CORROSION: FUNDAMENTALS AND APPLICATIONS (3).** Pr., departmental approval. Nature and mechanisms of corrosion. Effects of: material-manufacturing methods, construction and environment. Corrosion types and methods of corrosion control.
662. **PERFORMANCE OF METALS AT ELEVATED TEMPERATURES (3).** Pr., departmental approval. Fundamental behavior of metals of elevated temperatures. Commercial and experimental types of ferrous and nonferrous alloys and their suitability for elevated temperature applications.
665. **STRENGTHENING OF METALS (3).** Pr., ME 335. A treatment of the six basic mechanisms by which metals are strengthened. Emphasis is placed on causative factors and accompanying manifestations.

666. **PLASTICITY OF METALS (3).** Pr., ME 335. A quantitative treatment of: the minimization of plastic flow by means of design consideration where the phenomenon is associated with deleterious effects; the maximization of plastic flow by means of material-condition and forming method considerations where the objective is to form or shape.
667. **DISLOCATION THEORY (3).** Pr., departmental approval. The nature and properties of dislocations including crystal structure and imperfections, dislocation geometry in both ideal and real crystals, dislocation configurations, multiplication and interactions with various imperfections, and methods of observation.
669. **ADVANCED POLYMER SCIENCE AND TECHNOLOGY (4).** LEC. 3, LAB. 3. Pr., MTL 515, MTL 516. New concepts of polymer microstructure and new characterization methods, new developments in morphology and mechanical behavior study, polymer viscoelasticity, advanced processing technology.
670. **COMPOSITE MATERIALS (4).** LEC. 3, LAB. 3. Pr., MTL 515 or departmental approval. Principles of fiber reinforcement, fiber science and technology, resin chemistry, composite fabrication technology, deformation and fracture in composite, design and applications of polymer composites.
671. **WELDING METALLURGY (3).** Pr., departmental approval. Description of welding processes, properties and physical metallurgy of welding joints.
672. **MATERIALS FAILURE ANALYSIS (4).** LEC. 3, LAB. 3. Pr., departmental approval. Introduction to techniques and methods used to pinpoint causes of failure in manufactured parts.
675. **PLANAR MECHANISMS (3).** Pr., ME 323. Analysis of simple and complex planar mechanisms. Synthesis by finite displacement and infinitesimal motion methods.
676. **SPATIAL MECHANISMS (3).** Pr., ME 675. Analysis and synthesis of spatial mechanisms.
677. **SELECTED TOPICS IN MECHANICAL DESIGN (3).** Pr., ME 630 and 685. Dynamic properties of trains of mechanisms; hydrostatic and hydrodynamic lubrication; thermal equilibrium; wear and fatigue problems; design techniques utilizing modern computational facilities.
678. **CONCEPTUAL DESIGN OF MECHANICAL SYSTEMS (3).** Pr., ME 440 or departmental approval. Engineering problem definition; solution set development; selection criteria; optimization techniques; utilization of computational methods in the design of components.
679. **DYNAMIC SYSTEMS DESIGN (3).** Pr., ME 527 or departmental approval. Design of time-responsive systems; system modeling and simulation; development of system component requirements; determination of the characteristics of the designed systems.
680. **NOISE CONTROL IN MECHANICAL SYSTEMS (3).** Pr., departmental approval. Sound: its propagation, reflection; absorption; scattering; sources in machinery. Alteration of machine parameters for noise reduction.
681. **DESIGN FOR OPTIMUM ENERGY UTILIZATION (3).** Pr., ME 604 or departmental approval. Design and selection of energy systems for optimum energy utilization in commercial, industrial, residential and transportation sectors.
682. **ENVIRONMENTAL SYSTEMS DESIGN (3).** Pr., ME 604 or departmental approval. Design of environmental systems for the support of life, for comfort, for control of local environmental envelopes.
683. **SOLAR ENERGY UTILIZATION (3).** Pr., ME 622 or departmental approval. Measurement and utilization of solar energy for terrestrial applications.
684. **COMBUSTION AND FUEL TECHNOLOGY (3).** Pr., ME 303 and 521. Conventional and nonconventional fuels, thermodynamics and chemical kinetics of combustion processes, diffusionally and kinetically controlled combustion processes, knocking in internal combustion engines, and instability of flame fronts.
687. **AUTOMATIC MACHINERY AND PROCESS (5).** Pr., ME 532 or equivalent. Analysis and control of automatic machinery and automatic processes. Design and layout of production machinery for automatic and continuous flow.
688. **PRODUCTION ENGINEERING LABORATORY (2-5).** Pr., ME 537 or equivalent. Actual production problems associated with highly engineered products are addressed with the goal of reducing transition problems between prototype and full production of high-technology components and systems.
689. **ENGINEERING DESIGN PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter. Pr., departmental approval. Non-thesis option in the Master of Mechanical Engineering program. Project description and objective must be stated in letter requesting approval to take course. Provides a separate course for the student wishing to complete an engineering design project as required in the non-thesis option.
690. **SEMINAR. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
691. **DIRECTED READING IN MECHANICAL ENGINEERING. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
692. **ENGINEERING ANALYSIS (3).** Pr., departmental approval. Equilibrium, eigenvalue, and propagation problems of continuous systems. Physical laws and mathematical properties discussed with considerable emphasis on numerical solutions.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Military Science (MS) **GENERAL MILITARY COURSE** (Basic Program) Military Science I

101. **THE U.S. ARMY TODAY (1).** Overview of the United States Army and its role in American society and international affairs. Additional topics include junior officer duties and responsibilities; organization and structure of the Army and the role of the Army National Guard and Reserve. Includes hands-on experience in rappelling.
102. **CONTEMPORARY MILITARY ISSUES (1).** An opportunity for students to research, analyze and discuss current issues involving the military. Topics to be discussed include Central America, the MX Missile, the draft, NATO, etc.
104. **MOUNTAINEERING (2).** Same course as PE 104. Basic climbing techniques and rappelling. Class presentations covering ropes, knots, snap links and all associated equipment for climbers. Includes both discussion and practical exercises. Requires a weekend field training exercise with climbing and rappelling at Talledega National Forest.
105. **PISTOL MARKSMANSHIP (2).** Same course as PE 105. Basic instruction and pistol firing exercises covering various shooting positions. Instruction is designed to expose the student to marksmanship as a challenging recreational sport.
139. **WILDERNESS SKILLS (2).** Same course as PE 139. A personal confidence building course that provides an introduction to camping techniques in a woodland environment; emergency first aid procedures; basic shelter preparation; basic food procurement and preparation techniques and basic camping equipment.
162. **RIFLE MARKSMANSHIP (2).** Same course as PE 162. Introductory course in .22 caliber three position target shooting. Course covers firing safety, rifle range procedures and practice in prone, kneeling and standing positions. Designed to familiarize students with rifle marksmanship as a leisure sport.

Military Science II

201. **MILITARY POWER AND NATIONAL SECURITY (2).** Examines the purpose, structure, and function of the United States national security system vis-a-vis the Soviet national security system. Class topics include contemporary issues concerning the military services and their relationship within American society; United States and Soviet tactical and strategic considerations; political aspects of conflict and the concept of military power. Includes practical application of tactical and strategic concepts.
202. **MAP READING AND TROOP LEADING PROCEDURES (2).** Basic introduction into the military arts of map reading and operational planning using the standard U.S. Army Troop Leading Procedures. Instruction trains students to identify terrain features on a map and interpret topographic and map symbols, determine elevation of a point using military grid reference system, and to determine and plot directions on a military map. Map reading instruction is followed by indepth instruction covering the eight troop leading procedures used by military leaders in planning and organizing operations. Procedures follow an orderly process that ensure all necessary steps are taken to prepare for an operation.
203. **LEADERSHIP AND MANAGEMENT (2).** Basic introduction to the principles and techniques of leading and managing people, with material and other resources. Includes small group leading and managing exercises. Class topics include personnel performance, personal and career counseling, delegation of authority, acceptance of responsibilities, leadership principles and qualities of effective leaders. This course is applicable to effective leadership and management in the military as well as in civilian industry.
206. **MODERN MILITARY WEAPONS AND OPERATIONS (2).** Indepth instruction in the use of military weapons, tactics and operations by the United States Army and its allies as well as those used by the Communist Bloc nations. Class topics include comparative weapon systems; study of the Soviet and American soldier and their lifestyles and small unit tactics to include the use of unconventional warfare and special operations. Includes practical familiarization with U.S. and Communist bloc weapons in a field environment.

(Advanced Program) **Military Science III**

301. **LAND NAVIGATION TECHNIQUES (3).** Detailed map reading instruction to include marginal information, types and uses of maps, the military map system, military symbology, overlays, aerial photographs, determination of map distance, scale, elevation, relief, as well as techniques of expedient orientation in the field and use of the lensatic compass. Includes a day and night land navigation practical exercise conducted at Ft. Benning, Ga.
302. **MILITARY TRAINING AND INSTRUCTION TECHNIQUES (3).** Introduction to the U.S. Army's Battalion Training Management System (BTMS). Applied practical exercises in planning, coordinating, and executing military training. Includes practical exercises in lesson plan development and student presentation of performance oriented classes; to understand military leadership theory, and apply the decision making process, solve problems and implement plans. Conduct of a live-fire M16A1 rifle practical exercise at Ft. Benning, Georgia.
303. **MILITARY QUALIFICATION SKILLS (3).** Hands-on military training in the basic skills common to all junior officers. I.e., patrolling techniques, small unit tactics and operations, radio and wire communications, various weapons employment, combat intelligence, troop leading procedures and orientation on the various branches of the Army plus career opportunities. Includes physical conditioning two days each week. Culminates with a weekend practical skills application exercise at Ft. Benning, Georgia.
305. **RANGER OPERATIONS AND TACTICS (2).** LAB 2 HR. Mountaineering, advanced survival skills, land navigation, physical conditioning, small unit tactics and patrolling techniques, and two weekend training exercises per quarter.
306. **LEADERSHIP LAB (1).** Practical experience in military training and leadership. Mandatory requirement for all contract students. Recommended for all non-contract students.

Military Science IV

401. **MILITARY JUSTICE AND ETHICS (3).** Introduction to the Military Justice System, legal procedures and command responsibilities to include counseling and legal advice. Practical ethics instruction including responsibilities and behavior of officers, the military ethic and the evaluation of the military as a profession.
402. **ADVANCED LEADERSHIP AND MANAGEMENT I (3).** Intermediate instruction in the principles and techniques of leading and managing individuals and groups. Focus is on solving junior leader problems and challenges. Class topics include platoon motivation, individual counseling, team goals, and intermediate objectives. Extensive use of case studies reinforce learning objectives and task completion.
403. **ADVANCED MILITARY LEADERSHIP AND MANAGEMENT II.** Comprehensive instruction in the principles of small unit leadership and management. Class topics include the personnel management system, customs and courtesies of the service, utilization of enlisted personnel, branch orientations and duties and responsibilities of a junior officer.
404. **LEADERSHIP LAB (0). 2 HR. LAB.** For advanced ROTC cadets not enrolled in ROTC courses during a quarter due to leave of absence or completion of all commissioning requirements.

Music (MU)

Professors Moore, Rosenbaum, Smith, Tamblin, and Walls
 Associate Professors Kafer, Head, Bennett, C. Gossett, Greenleaf, Howard, J. Morgan,
 L. Morgan, Richardson, Stephenson, Summerville, Vinson, and Alexander
 Assistant Professor Faust
 Instructors Bowman, S. Gossett, Harrison, and Wiley

(T) indicates courses taught primarily for music education students.

100. **PERFORMANCE ATTENDANCE (0).** All quarters. Required of all music students each quarter. Performance & lectures by faculty, guest artists, and students. Music & music education majors are expected to perform at the teacher's discretion and in accordance with departmental rules.
- 131-132-133. **MATERIALS AND ORGANIZATION OF MUSIC (5-5-5).** A systematic study of harmony, counterpoint, form and style through the literature of music.
- 211-212. **SERVICE PLAYING (1).** Hymn playing, modulation, selected anthems and oratorio selections, simple improvisation and transposition.
- 231-232-233. **MATERIALS & ORGANIZATION OF MUSIC (5-5-5).** Pr., MU 133. Continuation of the study of harmony, counterpoint, form and style in music.
- 251-252-253. **SURVEY OF MUSIC LITERATURE (1-1-1). LEC. AND LAB. 3-3-3.** Presentation of instrumental solo, opera and symphonic music, acquainting the student with musical compositions and composers with emphasis on music literature of the past three centuries.
311. **LITURGIES (3).** Liturgical worship service of Roman Catholic and Protestant churches, plus non-liturgical forms of other Protestant denominations.
312. **HYMNOLOGY (3).** The musical significance of hymns of the Christian church from the earliest times to the present.
- 331-332-333. **MATERIALS AND ORGANIZATION OF MUSIC (5-5-5).** Pr., MU 233. Continuation of second year systematic study of harmony, counterpoint, form and style through the literature of music.
- 334-335-336. **MUSIC COMPOSITION I, II, III (1-1-1).** Pr., MU 233. Creative experience of various technics in smaller design and apparatus.
- 337-338-339. **MODERN HARMONY I, II, III (3-3-3).** Pr., MU 233. Twentieth century harmonic devices. An integrated approach to understanding contemporary writing with emphasis on original work and analysis of the principal departments from "traditional" harmony.
- 351-352-353. **MUSIC HISTORY I, II, III (3-3-3).** Development of music from early times to the present day. Lectures, recorded examples, readings.
- 361-362-363. **CONDUCTING I, II, III (2-2-2).** Pr., MU 133. I. Basic conducting technique and introduction to score reading. II. Advanced conducting technique, score reading, and interpretation with specialization in either choral or instrumental areas. III. Advanced conducting techniques and score reading with opportunity for practical experience in preparing choral groups and instrumental groups for performance.
371. **INTRODUCTION TO MUSIC (3).** Open to Elementary Education and Family and Child Development Majors only. The understanding of music including an explanation of basic terms, notations, rhythm, tonal system, vocal and piano score readings.
- 409T. **MARCHING BAND TECHNIQUES (3).** Fundamental methods and procedures of the Marching Band.
- 410T. **ORCHESTRAL TECHNIQUES (3).** Pr., junior standing. Methods and procedures of rehearsing the orchestra in areas of articulation, tone production, blend, balance, intonation, and musical expression.
- 411T. **CHORAL TECHNIQUES (3).** Pr., junior standing. Methods and procedures of rehearsing choral groups in areas of diction, tone production, blend, balance, intonation, and musical expression.

414. **CARE AND REPAIR OF MUSICAL INSTRUMENTS (1).** LEC. 1, LAB. 3. Pr., senior standing. Selection, care and repair of woodwind, brass and string instruments with emphasis on adjustments which should be made by the instrumental director.
415. **ORGAN LITERATURE AND DESIGN (3).** Survey of organ literature correlating the forms of compositions and types of organs for which the music was written.
416. **CHURCH MUSIC SEMINAR (3).** Pr., MU 311, 312, 361, 362, 415, or 422, or COI. The processes of establishing a complete Church Music program. Supervised directing of choral ensemble.
- 434-435-436. **MUSIC COMPOSITION I, II, III (3-3-3).** Pr., 233. Analysis, study, and writing of musical compositions in small, compound, and larger musical forms with emphasis on both stylistic and individual creative writing.
- 442T. **VOCAL PEDAGOGY (3).** For prospective voice teachers. An intensive study of the materials and methods of voice training. Classification and analysis of teaching repertoire.
- 443T. **STRING PEDAGOGY (3).** Mechanics of stringed instruments. Teaching methods, schools, and systems. Teaching literature and repertoire. For either violin, viola, cello, string bass or harp.
- 444T. **INSTRUMENTAL PEDAGOGY (3).** Mechanics of brass or woodwind instruments. Teaching methods and repertoire with emphasis on solo instrumental literature.
445. **THEORY PEDAGOGY (3).** Required of seniors majoring in theory and composition. Designed to present the problems of sightsinging, rhythmic dictation, melodic and harmonic dictation, and part writing from a pedagogical viewpoint.
- 447-448-449. **PIANO PEDAGOGY (3-3-3).** For prospective piano teachers. Teaching methods for beginners in private and group instruction. The intermediate and advanced student. Analysis of teaching repertory. Observation and practical experience.
452. **VOCAL LITERATURE (3).** Pr., junior standing. Vocal literature from Elizabethan time to the present, including representative European and American repertoire.
- *454. **INSTRUMENTAL LITERATURE (3).** Pr., junior standing.
455. **OPERA LITERATURE (3).** Pr., junior standing. Vocal music of the opera from the Baroque to the present time.
- **457-458-459. **KEYBOARD LITERATURE (1-1-1).** Pr., junior standing. Masterwork for keyboard from the Baroque Period to the present.
477. **INSTRUMENTAL ARRANGING (3).** Pr., MU 233 or COI. Project course in arranging various instrumental combinations from quarter to symphonic band.
478. **CHORAL ARRANGING (3).** Pr., MU 233 or COI. Project course in arranging for various combinations.

ADVANCED UNDERGRADUATE AND GRADUATE

- 522-523-524. **THEORY REVIEW (3-3-3).** No credit for Applied Theory Composition or Pedagogy Majors. Harmonic techniques of the 18th and 19th centuries, with special emphasis on style and design.
- 537-538-539. **ORCHESTRATION I, II, III (3-3-3).** Pr., MU 233. Ranges, notation, and characteristics of orchestral instruments. Exercises in arranging for combinations of string and wind instruments. Theory and practice of orchestration for full orchestra.
553. **CHORAL LITERATURE (3).** Pr., junior standing. Chronological study of choral music from the Middle Ages to the present including opera, and oratorio with detailed examination of representative works.

GENERAL ELECTIVE COURSES

201. **FUNDAMENTALS OF MUSIC (3).** Music primarily to develop functional piano skills, sight-reading, rhythm and melodic skills.
372. **HISTORY OF JAZZ (3).** The growth of Jazz from its African and European roots to current experimentation.
373. **APPRECIATION OF MUSIC (3).** May not be taken for credit by Music Majors or Minors. Outstanding composers and compositions. No previous music training required; an orientation in the art of listening.
374. **MASTERPIECES OF MUSIC (3).** May not be taken for credit by Music Majors or Minors. Representative musical works of each great period of musical history. No previous music training required.

GROUP PERFORMANCE COURSES

- 121-122-123. **UNIVERSITY SINGERS (1 HOUR CREDIT PER QUARTER).** May be taken with or without credit. A select choral ensemble for study and performance of madrigals, pop music, show tunes, and choral music of the jazz idiom. Open to any Auburn student by audition only.
- 124-125-126. **CONCERT BAND (1 HOUR CREDIT PER QUARTER).** Members of the Band are selected during the first week of each quarter. A minimum of 4 rehearsal hours per week is required, with extra rehearsals scheduled as necessary. Band members are required to be present at all rehearsals and all public performances. Students enrolled in Concert Band will have the drill portion of Basic Military Training waived. (May be taken with or without credit.)
- 127-128-129. **ORCHESTRA (1 HOUR CREDIT PER QUARTER).** Members of the symphonic orchestra are selected by try-outs during the first week of each quarter. (May be taken with or without credit.)

130. **JAZZ LABORATORY BAND (1).** A musical ensemble for the study and performance of music relating to the jazz idiom. By audition only.
- 221-222-223. **CHORAL UNION (1 HOUR CREDIT PER QUARTER).** Open to any Auburn student by consent of choral director. (May be taken with or without credit.)
224. **MARCHING BAND (1 HOUR CREDIT PER QUARTER).** Fall Quarter only. Provides music for athletic contests and half-time shows at football games, various parades, pep rallies, and other campus and off-campus events. During the fall quarter, will rehearse a minimum of 6 hours per week. Physical Education may be waived for members of the Marching Band. In addition, students will have the drill portion of basic military waived when enrolled in Marching Band. See Band Director for details. (May be taken with or without credit.)
- *The literature of the major performance area.
**Restricted to piano pedagogy majors only.
- 227-228-229. **OPERA WORKSHOP (1 HOUR CREDIT PER QUARTER).** Open to all students interested in opera, including performance, stage-craft, make-up, conducting, and coaching. A minimum of three hours per week rehearsal or stage-craft is required with extra time scheduled as necessary. (May be taken with or without credit.)
- 321-322-323. **CONCERT CHOIR (1 HOUR CREDIT PER QUARTER).** CONCERT CHOIR is a mixed chorus for study and performance of serious choral literature; open to any Auburn student by audition only. (May be taken with or without credit.)
- 324-325-326. **MUSIC ENSEMBLE (1 HOUR CREDIT PER QUARTER).** COI. Primarily for advanced musicians for the study and performance of musical compositions for small instrumental and vocal groups. A minimum rehearsal of three hours per week required. (May be taken with or without credit.) Includes brass, woodwind, percussion and piano ensembles.
327. **PIANO ENSEMBLE (1 HOUR CREDIT PER QUARTER).** Study through performance of the ensemble literature for keyboard. May be repeated for credit.

PERFORMANCE

Individual instruction is available in voice, piano, organ, strings, woodwinds, harp, brass and percussion. One 1 hour lesson or two half-hour lessons per week.

Students desiring study in performance must be approved by the Head of the Department of Music before entrance into the course.

080. **PERFORMANCE (0).** May be repeated. Individual instruction in instrumental or vocal areas. Rudimentary practice as related to each discipline.
181. **PERFORMANCE (3).** Individual instruction in instrumental or vocal areas for performance, church music majors only. May be repeated.
381. **PERFORMANCE (3).** Pr., 6 qtrs. of MUA 181. Individual instruction in instrumental or vocal areas. Performance and Church majors only. May be repeated.
- 481-482-483. **PERFORMANCE (3-3-3).** Individual instruction in instrumental or vocal areas. For Bachelor of Music majors only.
184. **PERFORMANCE (1).** Individual instruction in instrumental or vocal areas. For piano pedagogy, theory/composition, bachelor of arts majors, and music education minors. May be repeated.
384. **PERFORMANCE (1).** Pr., 6 qtrs. of MUA 184. Individual instruction in instrumental or vocal areas. For piano pedagogy, theory/composition, bachelor of arts majors, and music education minors. May be repeated.
187. **PERFORMANCE (1).** Individual instruction in instrumental or vocal areas. For students in elementary and secondary education, and performance minors and electives. May be repeated.
387. **PERFORMANCE (1).** Pr., 6 qtrs. of MUA 187. Individual instruction in instrumental or vocal areas. For students in elementary and secondary education, and performance minors and electives. May be repeated.
660. **PERFORMANCE (3-3-3).**

The amount of credit in Performance study is based on the following practice schedule:

- 1 cr. hr. — 5 hours weekly practice.
- 3 cr. hrs. — 15 hours weekly practice.

Individual Instruction Fees Per Course (Per Quarter) . . . \$45.00

This additional fee to be paid at the time of registering for each Performance Course of individual instruction. Instruction is available in one hour or two half-hour lessons per week.

CLASS INSTRUCTION IN PERFORMANCE

The Music Department offers a number of classes in Performance open to Music Majors and Minors and to regularly registered college students who have had previous music training. These classes meet two hours per week and carry one hour credit.

- 101-102-103T. FRETTED INSTRUMENTS CLASS (1-1-1), (2-2-2 LEC. AND LAB.).** Class instruction and practice in the rudiments of music as applied to the guitar, ukulele, and other fretted instruments.
- 104-105-106. PIANO CLASS (1-1-1), (2-2-2 LEC. AND LAB.).** Class instruction and practice in the rudiments of music as applied to piano playing.
- 107-108-109. VOICE CLASS (1-1-1), (2-2-2 LEC. AND LAB.).** Class instruction and practice in the rudiments of music as applied to voice.
- 110-111-112T. STRING INSTRUMENTS CLASS (1-1-1), (2-2-2 LEC. AND LAB.).** Class instruction and practice in the rudiments of music as applied to violin, viola, cello and contrabass playing.
- 113-114-115T. BRASS INSTRUMENTS CLASS (1-1-1), (2-2-2 LEC. AND LAB.).** Class instruction and practice in the rudiments of music as applied to trumpet, trombone and other brass instruments.
- 116-117-118T. WOODWIND INSTRUMENTS CLASS (1-1-1), (2-2-2 LEC. AND LAB.).** Class instruction and practice in the rudiments of music as applied to clarinet, oboe, bassoon, flute and other woodwind instruments.
- 119T. PERCUSSION INSTRUMENTS CLASS (1), (2 LAB.).** Class instruction and practice in the rudiments of music as applied to playing the snare drum.
- 120T. ADVANCED PERCUSSION INSTRUMENTS CLASS (1), LEC. 2, LAB. Pr., MU 119T or COI.** Class instruction and practice in the rudiments of music as applied to playing timpani, the keyboard mallet instruments, and the other miscellaneous percussion instruments.

ADVANCED UNDERGRADUATE AND GRADUATE

- 522-523-524. THEORY REVIEW (3-3-3).** Pr., senior standing and departmental approval. No credit for Applied, Theory-Composition, or Pedagogy majors. A review of the harmonic techniques of the 18th and 19th centuries, with special emphasis on style and design.

GRADUATE

- 600-601-602. ADVANCED INSTRUMENTAL AND CHORAL CONDUCTING (2-2-2).** Laboratory for development of skills relating to the performance of traditional and modern works. Emphasis on score reading and analysis. Participation in an approved instrumental or choral ensemble is required.
- 603. BRASS INSTRUMENTS TECHNIQUES (1), LEC. 1, LAB. 3.** Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on brass instruments. Participation in an approved instrumental organization is required. May be repeated for a maximum of 3 hours credit.
- 604. WOODWIND INSTRUMENTS TECHNIQUES (1), LEC. 1, LAB. 3.** Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on woodwind instruments. Participation in an approved instrumental organization is required. May be repeated for a maximum of 3 hours credit.
- 605. PERCUSSION INSTRUMENTS TECHNIQUES (1), LEC. 1, LAB. 3.** Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on percussion instruments. Participation in an approved instrumental organization required. May be repeated for a maximum of 3 hours credit.
- 606. MUSIC IN THE ARTS (4).** Music in relation to architecture, the plastic arts, and poetry.
- 607. CHORAL LITERATURE OF THE CLASSIC, ROMANTIC AND MODERN PERIODS (4).** The styles, forms, and performance practices of choral music from the Classic, Romantic and Modern periods, working primarily with scores of representative works. Participation in an approved choral organization is required.
- 608. CHORAL ARRANGING (4).** Pr., departmental approval. Advanced Arranging for various choral combinations. Participation in an approved choral organization is required.
- 609. SEMINAR IN 20TH CENTURY MUSIC (3-3-3).** Pr., departmental approval. Analysis and comparison of representative works of principal composers of the first half of the 20th century. Specific works chosen for each quarter. (May be repeated for a maximum of 9 hrs. credit.)
- 610. BAND ARRANGING (4).** Pr., departmental approval. Advanced arranging for various band organizations. Participation in band is required.
- 611. ORCHESTRAL ARRANGING (4).** Pr., departmental approval. Advanced arranging for various orchestral organizations. Participation in orchestra is required.
- 612. ACOUSTICS IN MUSIC (3).** Pr., departmental approval. The physics of sound as related to music.
- 634. MUSIC HISTORY SEMINAR (2).** Pr., departmental approval. Different aspects of the history of music. Specific research areas chosen each quarter. May be repeated for a maximum of 6 hrs. credit.
- 644. REPERTOIRE SEMINAR (2).** Pr., departmental approval. Music literature in the student's major area through analysis & performance. May be repeated for a maximum of 6 hrs. credit.
- 650-651-652. TECHNIQUES OF PRIVATE INSTRUMENTAL INSTRUCTION (2-2-2).** Pr., departmental approval. Analysis of teaching and supervised teaching.

- 653-654-655. **TECHNIQUES OF PRIVATE INSTRUCTION IN VOICE (2-2-2).** Analysis of teaching and supervised teaching.
660. **INDEPENDENT STUDY IN PERFORMANCE (3).** Pr., departmental approval. Advanced private study and public performance each quarter. May be repeated for credit not to exceed 12 hours.
- 681-682-683. **INDEPENDENT STUDY IN (A) COMPOSITION, (B) ANALYSIS (2-3, 2-3, 2-3).** Pr., departmental approval.
697. **QUALIFYING RECITAL.**

Naval Science (NS)

111. **ORIENTATION TO THE NAVY AND MARINE SCIENCES (1).** LEC. 1, LAB. 2. Fall. Introduction to basic areas of Naval Science including such subjects as: uniforms and insignia, military courtesy, discipline, components and supporting elements of the Navy, logistics, communications, security, Naval Intelligence, oceanographic research.
- 112-113. **NAVAL SHIPS SYSTEMS I & II (2-2).** LEC. 2, LAB. 2. I Winter, II Spring. Principles of ship design, constr., and stability. Study of impaired stability and damage control. Shipboard auxiliary systems, basic electricity, intr. to thermodynamics and steam cycle as applied to Naval propulsion systems. Advanced propulsion and ship design including nuclear and gas turbine engines.
- 211-212. **NAVAL WEAPONS I & II (2-2).** LEC. 2, LAB. 2. I Winter, II Spring. Introduction to weapons systems through a study of fund. principles of sensor, tracking, computational and weapons delivery subsystems. Missile and underwater battery systems, practical applic. of various systems.
213. **SEAPOW AND MARITIME AFFAIRS (2).** LEC. 2, LAB. 2. Fall. A seminar course dealing with broad principles, concepts, and elements of seapower and maritime affairs with application to the United States and other world powers.
- 311-312. **NAVIGATION I & II (3-3).** LEC. 3, LAB. 2. I Fall, II Winter. The theory and principles of piloting involving the use of visual and electronic aids. The theory, principles and procedures of celestial navigation.
313. **NAVAL OPERATIONS (3).** LEC. 3, LAB. 2. Spring. Navy tactical formations and dispositions, relative motion, Rules of the Road, maneuvering board and communications.
- 321-322-323. **EVOLUTION OF WARFARE (2-2-2).** LEC. 2, LAB. 2. Fall, Winter, Spring. Forms of warfare practices to identify historical continuity and change in the evolution of warfare. Demonstrates concepts of strategy, examines great captains and military organizations of history to discover ingredients of their success and explores the impact of historical precedent and technological change on politico-military thought and action.
- 411-412-413. **PRINCIPLES OF NAVAL ORGANIZATION LEADERSHIP AND MANAGEMENT. (3-3-3).** LEC. 3, LAB. 2. Fall, Winter, Spring. Various tools and methods of leadership. The UCMJ from the division officer's perspective. Naval personnel administration, material mgt., and correspondence.
- 421-422-423. **AMPHIBIOUS WARFARE (2-2-2).** LEC. 2, LAB. 2. Fall, Winter, Spring. Amphibious warfare prior to WW II through Korean conflict; definitions of concept, examination of doctrinal origins, evolution of amphib warfare and tactics and techniques, and the current structure of the Fleet Marine Force and its equipment.

Nursing (NUR)

101. **ORIENTATION TO NURSING (1).** Fall. An introduction to the school program and personnel. Career exploration.
301. **PROCESSES FUNDAMENTAL TO NURSING (10).** LEC. 5, LAB. 10. Pr., completion of Pre-Nursing Science Program. Basic course emphasizing the nursing process and fundamental concepts and skills. Prerequisite to all other nursing courses.
311. **ADULT HEALTH NURSING I (14).** LEC. 6, LAB. 16. Pr., NUR 301. Prevalent health problems which influence people to seek health care. Varied clinical sites.
321. **MATERNAL-INFANT HEALTH NURSING (12).** LEC. 5, LAB. 14. Pr., NUR 301, 311. Nursing care of individuals/families to facilitate adaptation during the antepartal, intrapartal and postpartal aspects of childbearing.
331. **CHILD HEALTH NURSING (12).** LEC. 5, LAB. 14. Pr., NUR 301, 311. Explores the nurse-child-patient relationship. Nurse role components are carried out through deliberative actions of the nursing process. Responses of children to stressors affecting health status are considered.
340. **DIRECTIONS IN NURSING (3).** Pr., NUR 301. Past, present and future directions in nursing. Will explore concepts of accountability, ethical issues and the health continuum.
350. **PHYSICAL ASSESSMENT IN HEALTH AND ILLNESS (5).** LEC. 4, LAB. 2. Pr., NUR 301, CED 422, NUR 380. To be taken concurrently with NUR 311. An introductory course to the physical assessment of clients experiencing health or illness.
396. **HUMAN SEXUALITY IN HEALTH AND ILLNESS (3).** Junior standing, open to all University students. Explores human sexuality in relation to health-illness continuum. Opportunity to view sexuality across the life span.
412. **PSYCHIATRIC/MENTAL HEALTH NURSING (8).** LEC. 4, LAB. 8. Pr., NUR 301, 311, 321, 331. Nursing intervention to facilitate successful psychosocial adaptations to stressors in human relations that may impair health.
422. **COMMUNITY HEALTH NURSING (7).** LEC. 3, LAB. 8. Pr., NUR 301, 311, 321, 331. Nursing process used by students to facilitate maintaining, attaining, and regaining optimal health status by individuals and groups in ambulatory care settings.
442. **ADULT HEALTH NURSING II (12).** LEC. 5, LAB. 14. Pr., NUR 301, 311. Man's adaptations to severe physiological stress; emphasizes adaptation in adult developmental states, the nursing process, and therapeutic interpersonal relationships.

450. **SENIOR SEMINAR (2).** Pr., senior standing. Student has opportunity to explore socialization adaptation necessary for entry into the graduate professional nurse role.
482. **NURSING RESEARCH (3).** LEC. 3. Pr., NUR 301, 311, 321 & 331. Provides opportunity to explore the research process as systematic means for contributing to nursing knowledge. Processes of conducting research are examined.
490. **DIRECTED INDEPENDENT STUDY (1-3).** Pr., NUR 301. May be repeated to a maximum of 3 hrs. credit. Directed readings and/or clinical study in area related to Nursing of interest to student.
495. **MANAGEMENT IN NURSING (3).** Pr., senior standing. Explores management theories and leadership skills necessary in the management of a health care team.
499. **PRECEPTORSHIP (14).** LEC. 2, LAB. 24. Pr., all clinical nursing courses. To be taken concurrently with NUR 495. A clinical practicum designed to allow student indepth practice in a clinical setting prior to graduation.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **PATHOPHYSIOLOGY OF POTENTIALLY HANDICAPPING CONDITIONS IN YOUNG CHILDREN (3).** Credit for this course not accepted as credit for NUP 331. Designed for students pursuing careers in health related fields or other professions that service handicapped children. Handicapping conditions of infants, their treatment and implications explored.

Nutrition (NN)

(Interdepartmental Graduate Program)

651. **NUTRITION I. THE MACRO NUTRIENTS (5).** Pr., ADS-CH 519, ZY 524. The interrelationships among the energy-furnishing and structural nutrients, including carbohydrates, lipids and proteins. The digestion, absorption, transport and metabolism of these nutrients.
652. **NUTRITION II. THE MICRO NUTRIENTS (5).** A continuation of NN 651 with emphasis on the role of vitamins and minerals. A study of the interrelationships of nutrients and hormones. Effects of excesses and deficiencies on the organism.
653. **NUTRITION III. ASSESSMENT OF NORMAL AND ABNORMAL NUTRITIONAL STATES (5).** A continuation of NN 652, with emphasis on assessment of nutritional status of man and animals including an evaluation of standards, the human nutrition survey, clinical problems in nutrition, and hereditary and other disorders in metabolism.
654. **EXPERIMENTAL NUTRITION (5).** LEC. 2, LAB. 6. Pr., ADS-CH 519 and BY 501. Acquaints the student with the animal feeding experiment as a basis for research in nutrition. Includes balance studies and proximate analysis.
655. **NUTRITION SEMINAR (1).** Required of all students in the interdepartmental program in Nutrition. Must be taken three quarters.
656. **DIRECTED READINGS IN NUTRITION (3-5).** The development of nutrition as a science and a critical analysis of the classic and current literature in nutrition.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
799. **DOCTORAL RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Suggested courses offered in other departments: (For related courses at 500 level, see departmental listing.)

- ADS 620. MINERAL METABOLISM.
- ADS 621. ENERGY METABOLISM.
- ADS 622. PROTEIN METABOLISM.
- ADS 623. VITAMINS.
- ADS 625. ADVANCED MONOGASTRIC NUTRITION.
- ADS 627. ADVANCED RUMINANT NUTRITION.
- ADS 641. PROTEINS.
- ADS 642. LIPIDS.
- ADS 643. ENZYMES.
- ADS 645. BIOCHEMICAL RESEARCH TECHNIQUES.
- BY 601. BIOLOGICAL STATISTICS II.
- FAA 821. FISH NUTRITION.
- NF 624. ADVANCED HUMAN NUTRITION I.
- NF 625. ADVANCED HUMAN NUTRITION II.
- NF 626. ADVANCED HUMAN NUTRITION III.
- PH 610. ADVANCED POULTRY NUTRITION.
- VPH 601. MEDICAL PHYSIOLOGY I.

- VPH 602. MEDICAL PHYSIOLOGY II.
 VPH 638. PHYSIOLOGY OF DIGESTION.
 VPH 639. SMALL ANIMAL NUTRITION.

Nutrition and Foods (NF)

Professor Lane

Associate Professors Chastain, Clark, and Keith

Assistant Professors Azar, Buchanan, Craig-Schmidt, Svacha, and Walker

Instructors Dillard and Strawn

104. **PRINCIPLES OF FOOD PREPARATION (5).** LEC. 3, LAB. 4. Each quarter. Basic principles underlying the fundamental processes and standards of food preparation.
112. **NUTRITION AND MAN (3).** Each quarter. The fundamentals of nutrition and the influence of socio-economic and cultural patterns of man on fulfilling nutritional needs.
201. **INTRODUCTORY FOOD SCIENCE (3).** LEC. 2, LAB. 2. Principles of major food processing methods, concepts of food quality, nutrition, sanitation, safety of food additives and food laws. Overview of careers in food science and food technology. (Same course as FS 201.)
204. **MEAL MANAGEMENT (5).** LEC. 4, LAB. 3. Pr., NF 104 and 112. Planning of meals with emphasis on scientific principles of nutrition, aesthetic value, management of time and the food budget on various economic levels.
304. **QUANTITY FOOD PREPARATION (5).** LEC. 3, LAB. 4. Pr., junior standing and NF 204. Menu planning, preparation and sanitation in institutional service of food. Includes use, operation, and maintenance of equipment. Laboratory experience in university food service facilities. Credit will not be given for both NF 304 and NF 316.
307. **SURVEY OF DIETETICS (2).** LEC. 1, CLINICAL EXPERIENCE 3. Role and professional conduct of dietitians in various institutions. Open only to students enrolled in the Coordinated Dietetics Programs.
312. **CHILD NUTRITION (3).** LEC. 2, LAB. 2. Pr., NF 112. Application of nutrition in the development of the child from conception through adolescence.
316. **FOOD SERVICE: PLANNING, PRODUCTION, AND MANAGEMENT (10).** LEC. 5, CLINICAL EXPERIENCE 15. Pr., junior standing and NF 204. Principles of menu planning, preparation, and sanitation in institution food service. Use, operation and maintenance of food service equipment. Experience in cooperating facilities. Open only to students enrolled in the Coordinated Dietetics Program.
318. **NUTRITIONAL BIOCHEMISTRY (5).** LEC. 4, LAB. 3. Pr., CH 203. Chemistry of carbohydrates, fats, proteins, vitamins, and minerals applied to human nutrition.
324. **FOOD PRESERVATION (3).** LEC. 2, LAB. 3. Food spoilage mechanisms and their prevention.
346. **FOOD SERVICE ORGANIZATION AND MANAGEMENT (5).** Pr., NF 204, 304, MN 310. Management principles, methods of control and personnel management related to quantity food service operations. Credit will not be given for both NF 346 and NF 456.
358. **COMMUNITY AND FAMILY HEALTH (3).** LEC. 2, LAB. 2. Facilities, services, and agencies within the community which affect health. Field trips.
362. **PROBLEMS IN COMMUNITY NUTRITION (3).** Pr., NF 112, or equivalent. Environmental factors that influence the nutritional level of people.
372. **FUNDAMENTALS OF NUTRITION (3).** Pr., CH 203, BI 101. Principles of human nutrition and factors influencing nutrient requirements.
382. **PRINCIPLES OF NORMAL NUTRITION I (5).** LEC. 3, LAB. 4. Pr., NF 318 or equivalent. Physiological and biochemical bases of nutrient needs of the healthy individual. Methods of assessing nutritional adequacy of the diet.
392. **PRINCIPLES OF NORMAL NUTRITION II (5).** LEC. 3, LAB. 4. Pr., NF 382. Continuation of NF 382.
408. **INDEPENDENT OR FIELD STUDY (3-8).** Laboratory or field experiences approved and supervised by a faculty member. May be repeated for a maximum of 8 credit hours.
422. **COMMUNITY NUTRITION (10).** LEC. 5, CLINICAL EXPERIENCE 15. Pr., NF 392. Assessment of community nutritional status and methods used to effect change. Experience in cooperating facilities. Open only to students enrolled in the Coordinated Dietetics Program.
432. **MEDICAL DIETETICS (10).** LEC. 5, CLINICAL EXPERIENCE 15. Pr., NF 392. Principles of nutrition related to disease. Open only to students enrolled in Coordinated Dietetics Program. Experiences in cooperating institutions.
442. **ADVANCED MEDICAL DIETETICS (10).** LEC. 3, CLINICAL EXPERIENCE 21. Pr., NF 432. Emphasis on current research in dietetics and its clinical application. Experience in cooperating facilities. Open only to students in the Coordinated Dietetics Program.
446. **CATERING (3).** LEC. 2, LAB. 3. Pr., NF 204. Types of catered food service functions: planning, pricing, organization, management, equipment, and service.

456. **ADMINISTRATIVE DIETETICS (12).** LEC. 5, **CLINICAL EXPERIENCE 21.** Pr., NF 204, 316, 422, 442. The processes of planning, organizing, directing, evaluating, and controlling, applied to the administration of food service systems, medical dietetics programs, and community nutrition programs. Experiences in cooperating facilities. Open only to students enrolled in the Coordinated Dietetics Program.

ADVANCED UNDERGRADUATE AND GRADUATE

502. **DIET THERAPY (5).** LEC. 4, **LAB. 2.** Pr., NF 392. Application of principles of nutrition to various periods of stress and as a therapeutic aid in treatment of disease.
562. **NUTRITION AND PHYSICAL PERFORMANCE (4).** Pr., ZY 251, NF 318 or equivalent, and junior standing. The effects of nutrition on human physical performance and athletic ability.
564. **EXPERIMENTAL FOODS (5).** LEC. 2, **LAB. 6.** Pr., NF 104, CH 203, or COI. Effects of variation of ingredients and treatments on quality characteristics of foods.
572. **NUTRITION AND SOCIETY (5).** Pr., satisfactory course in nutrition and COI. Environmental practices that exist in a modern society. Credit will not be given for both NF 422 and NF 572.
578. **MODERN VIEWS OF NUTRITION (3).** Pr., satisfactory course in nutrition. Current concepts in nutrition and related fields.
582. **TEACHING NUTRITION TO CHILDREN IN SCHOOLS (3).** Pr., one nutrition course and junior standing. Methods for teaching nutrition principles and motivating changes in food habit of students in grades K-12. Focuses on nutrition education research as well as specific activities and objectives for various age groups.
588. **INTERNATIONAL NUTRITION (3).** Pr., satisfactory course in nutrition. Nutritional status of world population and local, national, and international programs for improvement.
592. **NUTRITION IN THE LIFE CYCLE (5).** Pr., NF 392 and junior standing. Metabolic and clinical approach to nutrition throughout the life cycle with emphasis on groups for whom nutrition is more crucial.

GRADUATE

601. **SEMINAR IN NUTRITION AND FOODS (1).** Each quarter. Attendance required every quarter. Students must include two credits in Plan of Study. A maximum of two credits may be counted toward graduation.
605. **METHODS OF RESEARCH IN HOME ECONOMICS (3).** Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Nutrition and Foods.
609. **SPECIAL PROBLEMS IN NUTRITION AND/OR FOODS. (2-5).** Pr., COI. May be taken more than one quarter.
620. **ADVANCED FOODS I (5).** Pr., NF 564 or equivalent and COI. Food quality assessment and chemistry of carbohydrates in foods.
621. **ADVANCED FOODS II (5).** Pr., NF 564 or equivalent and COI. Chemistry of fats and proteins in foods.
622. **PROBLEMS IN FOOD PRESERVATION (5).** Pr., BY 300. Various problems which grow out of advanced study of preservation of foods. These problems are subjects for minor research.
623. **READINGS IN NUTRITION AND/OR FOODS (5-10).** Pr., NF 382, CH 203. A critical survey of current literature. May be taken more than one quarter.
624. **ADVANCED HUMAN NUTRITION I (5).** Pr., NF 392 or equivalent. Carbohydrates, fats and proteins. Consideration will be given to the biochemical and physiological functions of these nutrients and their interrelationships in human nutrition.
625. **ADVANCED HUMAN NUTRITION II (5).** Pr., NF 392 or equivalent. Vitamins and minerals. Consideration will be given to the biochemical and physiological functions and interrelationships of these nutrients in human nutrition.
626. **ADVANCED HUMAN NUTRITION III (5).** Pr., NF 624 and 625, or equivalents. Assessment of human nutritional status. Dietary, biochemical and clinical methods of appraisal, and programs for improvement of status.
628. **RESEARCH METHODS IN NUTRITION (5).** A course designed to acquaint graduate students with modern laboratory techniques used in Human Nutrition Research.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** Required of all students under the Thesis Option in any field.

Pharmaceutical Sciences (PY)

Professors Riley, Head, Clark, Coker, Darling, Hamrick, and Wilken

Associate Professors Born and Ravis

Assistant Professors Brubaker, Davidson, DeRuiter, Hsieh, and Parsons

301. **PHARMACEUTICS I (4).** LEC. 4. Coreq., PY 301L. Physical-chemical principles are applied to develop an understanding of solid dosage forms and homogeneous liquid dosage forms. Selected official preparations are considered from this viewpoint.
- 301L. **PHARMACEUTICS I LABORATORY (1).** LAB. 3. Coreq., PY 301. Application of principles and techniques to preparation and usage of solid dosage forms including powders, tablets, capsules, and prolonged release types.

302. **PHARMACEUTICS II (4). LEC. 4.** Pr., PY 301, 301L, Coreq., PY 302L. A continuation of PY 301 dealing with heterogeneous and plastic systems and the physical and chemical principles applicable to plastic and polyphasic dosage forms including suspensions, colloids, mixtures, ointments, creams, emulsions and lotions.
- 302L. **PHARMACEUTICS II LABORATORY (1). LAB. 3.** Pr., PY 301, PY 301L. Coreq., PY 302. Application of principles and techniques to preparation and usage of liquid, heterogeneous and plastic dosage forms including solutions, syrups, elixirs, suspensions, emulsions, ointments, creams and lotions.
316. **MODERN METHODS OF DRUG ANALYSIS (4). LEC. 3, LAB. 3.** Pr., CH 301. Theory and application of physical and chemical methods with special emphasis on the use of chromatography, instrumentation, and nonaqueous systems in the analysis of pharmaceutical products.
401. **PHARMACEUTICS III (4). LEC. 4.** Pr., PY 302, 302L. Coreq., 401L. Influence of formulation on the therapeutic activity of a drug in a dosage form, emphasizing effects of dosage forms on biological response, physiological factors which may affect the drug contained in the dosage form and the dosage form of the drug itself.
- 401L. **PHARMACEUTICS III LABORATORY (1). LAB. 4.** Pr. or Coreq., PY 401. Laboratory exercises to demonstrate dosage form and physiologic influence on drug bioavailability and disposition.
403. **PHARMACEUTICS IV (2). LEC. 2.** Pr., PY 401, 401L. An introduction to the prescription, its interpretation, handling, compounding and dispensing together with pertinent calculations and techniques.
- 403L. **PHARMACEUTICS IV LAB. (1). LAB. 3.** Coreq., PY 403. A laboratory in which compounding and dispensing of prescriptions and proprietaries are practiced.
420. **MEDICINAL CHEMISTRY I (5).** Pr., CH 302, PY 316, ZY 561; Coreq., PY 531. Relationship of physicochemical properties to the pharmacological actions of therapeutic agents. The mechanism of action, classification and structure-activity relationships of drugs in terms of their physical and chemical properties.
421. **MEDICINAL CHEMISTRY II (4).** Pr., PY 420, 531; Coreq., PY 432, 532. A continuation of PY 420.
422. **MEDICINAL CHEMISTRY III (5).** Pr., PY 421, 532; Coreq., PY 433, 533. A continuation of PY 421.
432. **CHEMICAL PHARMACOLOGY LABORATORY (1). LAB. 3.** Pr., PY 420, 531, Coreq., PY 421 and 532. Laboratory exercises to demonstrate drug action, mechanism, and structure-activity relationship.
433. **CHEMICAL PHARMACOLOGY LABORATORY (1). LAB. 3.** Pr., 421, 532, Coreq., PY 422 and 533. Continuation of PY 432.
434. **NUCLEAR PHARMACY (3). LEC. 2, LAB. 3.** Pr., PY 532. Use of radioisotopic material in the diagnosis and treatment of disease, including the nature of radiation and its interaction with biological material, measurement of radioactivity, preparation of dosage forms, safe handling of isotopes and legal requirements of radiopharmacy.
436. **CANCER CHEMOTHERAPY (3). LEC. 3.** Pr., PY 533, COI. Consideration of theoretical and practical aspects of drug use in therapy of neoplasms.
444. **HYPERTENSION SCREENING AND EDUCATION (1).** Pr., PC 448. A comprehensive review of the etiology, pathology, and pharmacotherapeutics of hypertension. Participation in community screening and education experiences is required.
445. **DIABETES (1).** Pr., 4 PY standing. Physiology, pathology, and treatment of diabetes. Monitoring techniques of home therapy.
495. **SPECIAL PROBLEMS (1-3).** Pr., COI; may be repeated for a maximum of 8 credit hours.
502. **PHARMACOKINETICS (3). LEC. 3.** Pr., PY 401, PC 448. Study and characterization of the time course of drug absorption, distribution, metabolism, and excretion and the relationship of these processes to the intensity and time course of therapeutic and adverse effects of drugs.
510. **ADVANCED PHARMACEUTICS (3).** Pr., PY 401. Includes the basic physio-chemical and kinetic aspects which underlie the makeup and subsequent action of pharmaceutical dosage forms.
511. **ELEMENTS OF PHARMACEUTICAL MANUFACTURING (2). LEC. 2.** Pr., PY 302, 302L. Manufacturing procedures, operation and principles. In the laboratory selected pilot scale production problems are carried out to completion including control and testing of finished products.
- 511L. **PHARMACEUTICAL MANUFACTURING LAB. (3). LAB. 9.** Coreq., PY 511. Pilot scale production including control, evaluation, and testing of finished products.
512. **INTRAVENOUS ADMIXTURES AND STERILE PREPARATIONS (3). LEC. 1.** Pr., PY 302, Coreq., PY 512L. Principles involved in the preparation of IV admixtures, total parenteral nutrition, and sterile dosage forms in hospitals, clinics, and professional pharmacies.
- 512L. **INTRAVENOUS ADMIXTURES AND STERILE PREPARATIONS LABORATORY (1). LAB. 3.** Coreq., PY 512. Sterilization procedures, IV service techniques and total parenteral nutrition preparations are studied including the necessary calculations and equipment.
531. **PHARMACOLOGY I (5).** Pr., PC 346, 347 Coreq., PY 420. Biochemical and physiological effects, action mechanism, absorption, distribution, biotransformation, excretion, and therapeutic and other uses of drugs.
532. **PHARMACOLOGY II (5). LEC. 5.** Pr., PY 420, 531; Coreq., PY 421, 432. Continuation of PY 531.
533. **PHARMACOLOGY III (4). LEC. 4.** Pr., PY 421, 532; Coreq., PY 422, 433. Continuation of PY 532.
534. **TOXICOLOGY LABORATORY (1). LAB. 3.** Pr., ZY 561, PY 531 or COI, Coreq., PY 535. Exercises in acute and chronic toxicity, isolation, identification and analysis of metals, organic acids and bases from biological specimens.

535. **TOXICOLOGY (5).** Pr., ZY 561, PY 531 or COI. The basic science of poisons including the acute and chronic toxicology of common environmental, agricultural, industrial, commercial, medicinal and natural products.
536. **CELLULAR PHARMACOLOGY (5).** Pr., ZY 561, CH 302. Cytological basis of pharmacodynamics including metabolic energy transformation, protein synthesis, and cellular control systems as related to drug actions.
537. **FUNDAMENTALS OF BIONUCLEONICS (3).** LEC. 2, LAB. 3. Pr., PS 206, COI and second professional year standing. Theoretical and practical application of trace level radioactivity for research application to pharmacy and allied sciences.
538. **PHARMACEUTICAL METHODOLOGIES (5).** LEC. 2, LAB. 9. Pr., CH 302, ZY 561. Research principles and techniques utilized in evaluation of drug action, analysis and usage.

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601. **PARENTERAL PREPARATIONS (5).** LEC. 3, LAB. 6. Pr., PY 401 and COI. Theory, preparation and testing of various medicinal preparations intended for injection into the body. Pharmaceutical principles are applied to problems of filtration, sterilization, isotonicity, hydrogen ion concentration and aseptic techniques.
602. **TABLET MANUFACTURE (5).** LEC. 2, LAB. 9. Pr., PY 401. Essentials in the manufacture, coating and evaluation of compressed tablets.
603. **PRODUCT DEVELOPMENT (5).** LEC. 3, LAB. 6. Pr., PY 401. Formulation, evaluation and control techniques as well as actual manufacture of products of pharmaceutical and cosmetic nature.
604. **PHARMCEUTICAL LITERATURE (1).** Literature searching techniques, services, abstracting and writing, designed for the beginning graduate student in the pharmaceutical sciences.
608. **ADVANCED BIOPHARMACEUTICS (5).** LEC. 3, LAB. 6. Pr., COI. The relationship between physical and chemical properties of a drug and its dosage forms and the biological effects elicited following administration together with the relevant pharmacokinetics.
610. **COLLOIDAL AND INTERFACIAL PHENOMENA (5).** LEC. 4, LAB. 3. Pr., CH 508 or equivalent and COI. Interfacial and colloidal phenomena of chemical, biological, and pharmaceutical significance.
611. **STABILITY AND REACTION KINETICS OF PHARMACEUTICALS (5).** Pr., COI. The principles of chemical kinetics as applied to the unique stability problems of the various pharmaceutical dosage forms.
- 620-621-622. **CHEMISTRY OF SYNTHETIC DRUGS (5-5-5).** Pr., PY 422 or COI. Historical background, pertinent literature, organic name reactions, nomenclature, relation of chemical structure and physical properties to biological activity, isosterism, metabolite antagonism, enzyme inhibition, and exhaustive consideration of the chemistry and biological activity of the various therapeutic classes.
- 623-624-625. **SYNTHESIS OF DRUGS (5-5-5).** LEC. 2, LAB. 9. Coreq., PY 620-621-622 or COI. Laboratory procedures in the synthesis of intermediates and representative compounds studied in PY 620-621-622.
- 626-627. **ANALYTICAL AND CONTROL METHODS (5-5).** LEC. 3, LAB. 6. Pr., PY 316 or COI. The principles and techniques of analysis as applied to the various therapeutic classes.
628. **STEROID CHEMISTRY (5).** Pr., PY 620 or COI. Structure, determination, chemistry, synthesis and structure relationships of steroids of pharmacological and pharmaceutical importance.
629. **ALKALOID CHEMISTRY (5).** Pr., PY 620 or COI. Structure determination, chemistry and synthesis of alkaloids with emphasis on the alkaloids of pharmaceutical importance.
630. **FORENSIC AND ANALYTICAL TOXICOLOGY (5).** LEC. 3, LAB. 6. Pr., PY 535, PY 316 or equivalent. The medicolegal aspects of drugs and chemicals commonly encountered by humans and the modern methods used in their separation and identification. (Changes in course title, prerequisite, credit and description.)
- 631-632. **PSYCHOPHARMACOLOGY (5-5).** LEC. 4, LAB. 3. Pr., PY 536. Effect of neurotropic and psychotropic agents upon reverberatory circuits, chemical transmitters, neural amines, and metabolic energy systems; measures of rate of behavioral change; critique of behavioral screening techniques.
633. **BIOASSAY (5).** LEC. 4, LAB. 3. Pr., MH 267 or an equivalent course in statistics. Statistical basis for design of experiments and analysis of data in pharmacological quantitation.
637. **PHARMACOLOGY SEMINAR (1-3).** May be repeated for a maximum of 3 hrs. credit. Pr., graduate standing.
638. **TOXICOLOGY SEMINAR (1-3).** Pr., graduate standing. Students are expected to present review of current literature and case histories. This will be followed with discussion by students and faculty.
- 650-651. **ADVANCED TOXICOLOGY (5-5).** LEC. 3-3, LAB. 6-6. Pr., PY 535. Toxicological principles, testing procedures, legal requirement, mechanisms of action and treatment of medicinal, environmental and industrial toxicants. (Change in prerequisite and course description.)
660. **HETEROCYCLIC MEDICINAL CHEMISTRY (5).** Pr., COI. The chemical nature and behavior of heterocyclic moieties which are either themselves of medicinal significance or are components possessing therapeutic properties.
680. **GRADUATE SEMINAR (1).** Pr., admission to Graduate School. Required of all pharmacy graduate students each quarter.
681. **DIRECTED READING IN PHARMACAL SCIENCES. (1-5).** Pr., COI and 10 hours of 600-level courses. May be repeated for a maximum of 10 hours.
695. **SPECIAL PROBLEMS (2-5).** Pr., COI. May be repeated for a maximum of 8 hours.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**

Pharmacy Care Systems (PCS)

Professors Barker, Head, Cooper

Associate Professors Berger, Gibson, Newton, and Pearson

Adjunct Assistant Professors Henry, King, and Swensson

Adjunct Instructors Burnett and Felkey

261. **HISTORY AND ORIENTATION (3).** LEC. 3. Pr., PPY or PY standing. Introduction to delivery of health care services with emphasis on the role of the profession of Pharmacy.
360. **PHARMACY CONVOCATION (0).** Third professional year standing. Professional topics discussed by visiting lecturers, faculty, and students.
361. **DRUG LITERATURE ANALYSIS (3).** LEC. 3. Coreq., ZY 561, CH 302, and PY 302. Evaluation of current therapeutic and drug literature using the scientific method models.
461. **HOSPITAL PHARMACY I (3).** Pr., PY 302. The development of hospitals, their place in society, importance and place of pharmacy in hospitals, administrative and policy making aspects together with interdepartmental relationships.
462. **HOSPITAL PHARMACY LABORATORY (1).** LAB. 3. Pr., PY 401 and COI. Course may be repeated for a maximum of three credit hours. Hospital pharmacy experience is obtained in the environment of participating hospitals. Students are expected to furnish transportation for this elective course.
463. **HOSPITAL PHARMACY II (3).** Pr., PCS 461. The organization, staffing, services, legal requirements, and development of hospital pharmacy departments to provide drug use control, education, and research by hospital pharmacists.
464. **PHARMACY JURISPRUDENCE (5).** Pr., PCS 361. Basic legal and ethical principles of pharmaceutical patient care and their effect on the patient drug use process.
465. **PHARMACY OPERATING SYSTEMS (5).** LEC. 3, LAB. 6. Pr., PCS 261. Methods of systems and decision analysis applied to problems of optimizing the use of money, equipment, drug products, information and personnel within community and institutional environments.
466. **ENVIRONMENT OF DRUG DELIVERY (3).** Pr., PCS 261. Basic political, legal, social, ethical and economic principles of delivering the drug component of health care to patients.
470. **CLINICAL DRUG TRIALS (3).** LEC. 3. Pr., PCS 361, 473. The design, planning, and execution of protocols for Phase I, II, and III clinical drug trials, including the relative merits of prospective and retrospective methodologies for various disease states.
471. **PROFESSIONAL COMMUNICATIONS I (3).** LEC. 2, LAB. 3. Pr., PY standing. The nature, purpose and process of communication for the Health Professional. Interviewing, detailing, advertising, and patient counseling are covered along with patient education and information dissemination.
472. **PROFESSIONAL COMMUNICATIONS II (3).** LEC. 2, LAB. 3. Pr., PCS 471. Continuation of PCS 471.
473. **CLINICAL BIostatISTICS (3).** LEC. 3. Pr., PCS 361. Biostatistical analysis of clinical data including data collection protocols; psychological and biophysical medical assessment; descriptive and inferential statistics.
495. **SPECIAL PROBLEMS (1-3).** Pr., COI. Individualized investigation of pharmacy care systems problems as related to the delivery of health care services.
562. **INTRODUCTION TO MEDICATION INFORMATION SYSTEMS (3).** LEC. 2, LAB. 3. Pr., MN 207 and junior standing. Introduction to the design, control and planning of electronic information systems used to implement medication orders and manage the medication distribution system. Five concepts are emphasized.
563. **PUBLIC HEALTH (5).** LEC. 4, LAB. 3. Pr., BY 302, PCS 361 or equivalent. Epidemiological study of diseases of man. A survey of the public health and preventive medicinal programs of federal, state, local and private agencies is included.
564. **DRUG DISTRIBUTION SYSTEMS (5).** LEC. 4, LAB. 3. Pr., PCS 562, PCS 465, PCS 464. Application of the principles of cybernetics to drug distribution systems in hospitals, nursing homes, and other inpatient facilities.

GRADUATE

609. **INSTITUTIONAL PHARMACY (5).** LEC. 4, LAB. 3. Pr., PC 448, PCS 461, and COI. Comprehensive presentation of the development, responsibilities, classification, organization and administration of the pharmacy in hospitals, nursing homes, etc., from the viewpoint of the administrative pharmacist. Provides a survey of the responsibilities of the director of pharmacy service in a hospital.
680. **GRADUATE SEMINAR (1).** Pr., admission to Graduate School. Required of all pharmacy graduate students each quarter.
681. **HOSPITAL PHARMACY ADMINISTRATION (3).** Pr., PCS 461 or COI. Administrative and policymaking procedures regarding hospital economics, planning, staffing, communications, directing, controlling, design of facilities and operations. Provides an understanding of the socio-economic aspects of hospital pharmacy practice and competence in selected administrative skills needed by administrative pharmacists.
682. **RESEARCH METHODS AND DESIGN IN HEALTH SCIENCE I (3).** Pr., BY 501 or equivalent or COI. Description and application of the scientific methods to research problems unique to the health care field, including problem formulation, operational definitions, hypotheses, validity, reliability, research design, data collection by observation, questionnaires, and interviews; cost effectiveness analysis, clinical drug investigations, critiquing research.

- 683. **RESEARCH METHODS AND DESIGN IN HEALTH SCIENCES II (3).** Pr., PCS 682. Design and analysis of research problems in the health care field. The role of operational definitions, concept and construct linkage, hypotheses, and control in causal or covarying designs.
- 684. **MEDICATION INFORMATION SYSTEMS (3).** Pr., PCS 485 or COI. Design, control, and planning of information systems used to implement medication orders and manage the medication distribution system.
- 695. **SPECIAL PROBLEMS (2-5).** Pr., COI; may be repeated for a maximum of 8 credit hours.
- 699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**

Pharmacy, Clinical (PC)

Associate Professors Campagna, Head, Alexander, Janer, Lazarus, Tanja, and Thomasson
 Assistant Professors Beck, Griffies, Guenther, and McMillan
 Adjunct Professors Boshell and Haynes

Adjunct Assistant Professors Bowman, Carden, Como, Farringer, Haas, Hendrix,
 Huckleberry, Lockwood, Lyman, Moore, E. Morgan, W. Morgan, Moss,
 Norman, G. Parker, Payne, Pittman, Rivers, M. Short, Thompson,
 Tibbets, and R. Wilson

Adjunct Instructors Armour, Ball, Barr, Batt, Beasley, Brown, Coffey, R. Conkle, Cooper,
 Easter, Epp, Fortner, Harbuck, Holley, Johnston, Jones, B. Main, J. Main, McClure,
 McLemore, Morris, Moulton, Nelson, J. Parker, Peoples, Phillips, Sanchez, C. Scarborough,
 J. Scarborough, Schenk, B. Short, J. Silvey, L. Silvey, Stamitoles, Stephenson, Street,
 M. Turner, P. Turner, Walls, Weeks, D. Wilson, and Woodward

- 346. **CLINICAL EVALUATION OF DRUG THERAPY (3).** LEC. 3. Pr., CH 302, ZY 561, Coreq., PC 347. Examination of the use and interpretation of clinical laboratory test procedures as applied to monitoring therapy.
- 347. **HUMAN PATHOLOGY (5).** LEC. 5. Pr., ZY 561, CH 302, Coreq., PC 346. The general mechanisms and language of disease. Special emphasis on pathogenesis of disease to include an understanding of the dynamic nature of disease.
- 348. **PHARMACEUTICAL TERMINOLOGY (2).** LEC. 2. Pr., first professional year standing. Common terms and abbreviations used in the professional and scientific aspects of pharmacy and medicine.
- 447. **THERAPY OF DISEASE I (3).** LEC. 3. Pr., PY 420, 531, Coreq., PY 421, 532. The combination of pathophysiology, clinical chemistry, pharmacology, biopharmaceutics, etc., for specific diseases. To be presented through use of actual case studies with emphasis on the role of the pharmacist in treatment of patient.
- 448. **THERAPY OF DISEASE II (3).** LEC. 3. Pr., PC 447, Coreq., PY 422, 533. Continuation of PC 447.
- 449. **DRUG THERAPY IN CLINICAL PRACTICE (5).** LEC. 3. **CLINICAL CONFERENCE 1, LAB. 6.** Pr., PC 448, PY 533. A clinical clerkship involving the observation of drug effects in patients. Students monitor and evaluate drug action by participating in patient rounds and clinical conferences.
- 450. **AUTOTHERAPY (3).** LEC. 3. Pr., PC 448, PY 422, 533. Introduction to the triage function of the pharmacist. Evaluation of and response to patient illness complaints.
- 452. **DRUG INFORMATION ORIENTATION (2).** LEC. 2. Pr., PC 346, 347. Evaluation, assimilation, and dissemination of drug information.
- 453. **PROFESSIONAL PRACTICE (3).** LEC. 1, **LAB. 6.** Pr., 3rd prof. year standing. COI. Placement of students in various pharmacy practice environments to increase knowledge of practice options.
- 454. **CARDIOPULMONARY LIFE SUPPORT (1).** Pr., PC 448. The techniques used to administer basic life support to adults, children, and infants. The devices and drug therapy used in advanced cardiac life support.
- 455. **VENEREAL DISEASE EDUCATION AND CONTRACEPTION (1).** Pr., PC 448. The epidemiology, modes of transmission, prevention, diagnosis, and treatment of venereal diseases. The proper use, effectiveness, adverse effects and contraindications of contraceptive methods.
- 456. **DRUG ABUSE/POISON PREVENTION EDUCATION (1).** Pr., PC 448. Drugs and chemical substances used for non-therapeutic purposes and sepecific treatment modalities for intoxications.
- 457. **DRUG INTERACTIONS (3).** LEC. 3. Pr., PC 448, PY 422, 533. Mechanisms of drug interactions with other drugs, foods, endogenous materials and modifications of laboratory tests due to drugs.
- 459. **PRACTICE EXTERNSHIP (18).** **LAB. 40.** Pr., third professional year standing. A structured externship experience in various practice environments, including hospital, community, and other settings.
- 461. **INTRODUCTION TO THE CLINICAL ENVIRONMENT (5).** LEC. 1, **CONF. 3, LAB. 9.** Pr., PC 447, PC 448, and admission to Doctor of Pharmacy degree program. May substitute for PC 449 only for those students opting for the Doctor of Pharmacy program. Introduction to the institutional clinical environment to prepare the student for the responsibilities of the clerkships.
- 462. **APPLIED PHARMACOKINETICS (3).** LEC. 2, **REC. 3.** Pr., PY 502 and admission to Doctor of Pharmacy degree program. Clinical application of pharmacokinetics principles. Formulation of pharmacokinetic consultation services for actual patient cases including evaluation of the influences of disease, concurrent drug therapy, and altered organ function or bioavailability, disposition, and elimination of drugs having a narrow therapeutic index.

463. **ADVANCED THERAPEUTICS (6).** LEC. 6. Pr., PC 447, PC 448, and admission to Doctor of Pharmacy degree program. Study of disease states and drug therapy. Emphasis on identification of therapeutic goals and evaluation of effects of drugs on common disease states.
464. **DRUG INFORMATION RETRIEVAL AND ANALYSIS (3).** LEC. 3. Pr., PC 452, PCS 361, and admission to Doctor of Pharmacy degree program. Study of information retrieval, analysis, and communication. Emphasis on identification of literature resources and evaluation of information processing and communication techniques. Practical aspects of providing drug information services.
465. **CLINICAL SEMINAR (1).** LEC. 1. Pr., admission to Doctor of Pharmacy degree program. Coreq., Clerkship sequence. Student presentation of topics in drug therapy.
- 480-481-482. **PHARMACY CLERKSHIP (6-6-6).** LEC. 1, LAB. 39. 3-4 WEEKS. Pr., 459, Coreq., PC 480-481-482. Any quarter by arrangement. Conferences and clinical rotations with training in patient assessment, relational therapy, and drug consultations in various medical, surgical, and family medicine environments.
483. **CLERKSHIP — GENERAL INTERNAL MEDICINE (9).** Pr., PC 461, PC 462, PC 463, PC 464, and admission to Doctor of Pharmacy degree program. Clinical rotation of five weeks (200 hours). Rational pharmacotherapeutics, patient assessment, and communications in internal medicine.
484. **CLERKSHIP — AMBULATORY CARE (9).** Pr., PC 461, PC 462, PC 463, PC 464, and admission to Doctor of Pharmacy degree program. Clinical rotation of five weeks, (200 hours). Rational pharmacotherapy, patient assessment, and communications related to medication use in the ambulatory setting.
485. **CLERKSHIP — NEONATOLOGY (9).** Pr., PC 461, PC 462, PC 463, PC 464, and admission to Doctor of Pharmacy degree program. Clinical rotation of five weeks (200 hours). Rational pharmacotherapy, patient assessment, and communications related to medication use in pediatric patients.
486. **CLERKSHIP — PSYCHIATRY (9).** Pr., PC 461, PC 462, PC 463, PC 464, and admission to Doctor of Pharmacy degree program. Clinical rotation of five weeks (200 hours). Rational pharmacotherapy, patient assessment, and communications related to medication use in psychiatric patients.
487. **CLERKSHIP — SURGERY (9).** Pr., PC 461, PC 462, PC 463, PC 464, and admission to Doctor of Pharmacy degree program. May be taken in lieu of PC 491 or PC 492 with COI. Clinical rotation of five weeks (200 hours). Rational pharmacotherapy, patient assessment, and communications related to medication use in surgical patients.
488. **CLERKSHIP — MEDICINE SPECIALTY (9).** Pr., PC 461, PC 462, PC 463, PC 464, and admission to Doctor of Pharmacy degree program. Clinical rotation of five weeks (200 hours). Rational pharmacotherapy, patient assessment, and communications related to medication use in a specialty area of medicine.
489. **CLERKSHIP — CLINICAL PHARMACOKINETICS (9).** Pr., PC 461, PC 462, PC 463, PC 464, and admission to Doctor of Pharmacy degree program. May be taken in lieu of PC 492 with COI. Clinical rotation of five weeks (200 hours). Pharmacokinetic analysis of dosage regimens and consultation.
490. **CLERKSHIP — DRUG INFORMATION (9).** Pr., PC 461, PC 462, PC 463, PC 464, and admission to Doctor of Pharmacy degree program. Clinical rotation of five weeks (200 hours). Selection, storage, retrieval, assimilation, evaluation, and dissemination of drug information.
491. **CLERKSHIP — ELECTIVE AREA I (9).** Pr., PC 461, PC 462, PC 463, PC 464, and admission to Doctor of Pharmacy degree program. Clinical rotation of five weeks (200 hours). Rational pharmacotherapy, patient assessment, and communications related to medication use in a clinical area.
492. **CLERKSHIP — ELECTIVE AREA II (9).** Pr., PCY 461, PC 462, PC 463, PC 464, and admission to Doctor of Pharmacy degree program. Clinical rotation of five weeks (200 hours). Rational pharmacotherapy, patient assessment, and communications related to medication use in a clinical area.
495. **SPECIAL PROBLEMS (1-3).** Pr., COI. Individualized investigation of clinical pharmacy problems as related to the delivery of health care services.

Philosophy (PA)

Professors McKown, Head, Andelson, and Davis
Associate Professors Brown and Perry
Assistant Professors Lustig and Walters

111. **BASIC REASONING (3).** Elementary principles of clear thinking: meaning, definition, truth, induction, avoidance of fallacious thinking.
202. **ETHICS AND SOCIETY (5).** Examines topics of contemporary moral concern from the standpoint of various ethical theories.
210. **INTRODUCTION TO PHILOSOPHICAL PROBLEMS (3).** An introduction to the methods of philosophical inquiry and an examination of selected philosophical topics.
211. **INTRODUCTION TO DEDUCTIVE LOGIC (3).** Pr., PA 111 or COI. Principles of deduction in categorical, syllogistic, propositional, and predicate logics.
212. **INTRODUCTION TO SCIENTIFIC REASONING (3).** Inductive techniques of hypothesis formation, and a discussion of such related problems in the theory of knowledge as perception, causation, and confirmation.
214. **INTRODUCTION TO ETHICS (3).** Surveys various schools of moral philosophy and examines types of moral theory.
216. **PHILOSOPHIES OF MAN (3).** Examines philosophical anthropology by surveying alternative theories of human nature.

218. **ETHICS AND THE HEALTH SCIENCES (5).** Topics such as contraception, abortion, and eugenics; human experimentation; truth in drugs and medicine; death and dying; and other health related issues in order to clarify relevant ethical considerations and to provide philosophical bases for decisions on right and wrong, good and bad, rights and responsibilities.
220. **HONORS LOGIC (3).** Informal fallacies; term and syllogistic logic, elementary propositional logic.
221. **HONORS PHILOSOPHY (3).** Philosophical methods and their applications to problems in epistemology and metaphysics.
222. **HONORS ETHICS (5).** Major ethical theories from the history of philosophy; their foundations in epistemology and metaphysics, and their extension into social thought.
305. **AESTHETICS (5).** Examines theories of beauty and art from Plato to contemporary thinkers.
330. **PHILOSOPHY OF RELIGION (5).** Examines the nature of religion, religious language, religious knowledge, religious theories of man and evil, and examines arguments for the existence of God and the immortality of the soul.
333. **HISTORY OF PHILOSOPHY I. ANCIENT AND EARLY MEDIEVAL (5).** Surveys of philosophic thought from the Pre-Socratics through Aquinas, emphasizing Plato and Aristotle.
334. **HISTORY OF PHILOSOPHY II. LATE MEDIEVAL AND EARLY MODERN PHILOSOPHY (5).** Surveys philosophic thought from Occam to Kant emphasizing major thinkers.
335. **HISTORY OF PHILOSOPHY III. RECENT AND CONTEMPORARY PHILOSOPHY (5).** Surveys various representatives of the major philosophical trends during these periods.
370. **SYMBOLIC LOGIC (5).** Pr., PA 211 or COL. Formal logic systems; philosophical problems in logical theory.
380. **PRAGMATISM (5).** Emphasis on Peirce, James, and Dewey. Some philosophical issues examined from a pragmatic viewpoint.
401. **PHILOSOPHICAL FOUNDATIONS OF COMMUNISM (5).** Pr., junior standing. Examines the thought of Marx-Engels and its development in Kautsky, Bernstein, Lenin.
402. **EXISTENTIALISM (5).** Pr., junior standing. Selected works of such authors as Kierkegaard, Nietzsche, Sartre, Jaspers, and Heidegger.
425. **PHILOSOPHY OF MIND (5).** Pr., junior standing. Examines classical and modern texts on the phenomenology of consciousness and mind-body problems.
432. **PROCESS PHILOSOPHY (5).** Pr., junior standing. An examination of selected writings of Bergson, James, and Whitehead.
440. **CONTEMPORARY MARXISM (5).** Pr., junior standing. Examines the thought of Lukacs, Stalin, Merleau-Ponty, Sartre, Habermas, Marcuse, and others.
455. **METAPHYSICS (5).** Pr., junior standing. A critical analysis of such topics as monism and pluralism, freedom and determinism, realism and nominalism, and the mind-body problem.
460. **EPISTEMOLOGY (5).** Pr., junior standing. The origin, nature, kinds, and validity of knowledge, with a consideration of faith, intuition, belief, opinion, certainty, and probability.
470. **PLATO (5).** Pr., junior standing. Examines such topics as Plato's Methodology, epistemology, metaphysics, ethics, political theory.
475. **ARISTOTLE (5).** Pr., junior standing. Examines Aristotle's logic, epistemology, metaphysics, ethics, political theory, psychology.
479. **HONORS THESIS (3-6).** Repeatable once for a maximum of 6 hours credit. Senior thesis for students in the University Honors Program.
482. **BRITISH EMPIRICISM (5).** Pr., junior standing. Examines seventeenth and eighteenth-century empiricism emphasizing Locke, Berkeley, Hume.
484. **CONTINENTAL RATIONALISM (5).** Pr., junior standing. Examines major themes in such thinkers as Descartes, Spinoza, Leibniz, Gassendi.
498. **READINGS IN PHILOSOPHY (1-10).** Pr., junior standing, a 3.25 average in relevant prior work either in philosophy or in related areas and consent of department head and instructor. Specific reading programs may be developed which pertain to a particular philosopher, period or problem. A paper and an examination will be expected. May be repeated for credit.

ADVANCED UNDERGRADUATE AND GRADUATE

504. **MODERN ETHICAL THEORIES (5).** Recent analyses of the meanings, presuppositions, and problems of ethical terms and judgments.
513. **PHENOMENOLOGY (5).** The phenomenological method and its application in the works of William James, Husserl, Heidegger, Sartre, and Merleau-Ponty.
515. **PHILOSOPHY OF SCIENCE (5).** Such topics as empirical meaning, verifiability, measurement, probability, causality, and determinism.
580. **ANALYTIC PHILOSOPHY (5).** Philosophical analysis in the twentieth century from G. E. Moore through the Oxford analysis.

590. **KANT AND TRANSCENDENTAL IDEALISM (5).** The philosophy of Kant in particular but also of the early Fichte and Schelling and of neo-Kantians.
591. **HEGEL AND ABSOLUTE IDEALISM (5).** The philosophy of Hegel in particular but also of the late Fichte and Schelling, of neo-Hegelians, and of Schopenhauer and other critics.
592. **PHILOSOPHY OF LAW (5).** The nature and function of law, including such topics as judicial reasoning, the ground of authority, natural law, legal responsibility, punishment, civil disobedience, and the relation of law to ethics and the behavioral sciences.

GRADUATE

650. **SEMINAR (1-10).** Pr., COL. The content will change for each quarter in any one calendar year. This will vary from movements of thought to an intensive study of one of the great thinkers such as Plato or Whitehead. May be repeated for credit.

Physical Science (PHS)

Associate Professors Ward and Simon

- 100-101. **INTRODUCTORY PHYSICAL SCIENCE (5-5).** LEC. 4, LAB. 2. An introduction to physics, chemistry, astronomy, and earth sciences for students in liberal arts, education, business, and non-science pre-professional curricula. The approach is primarily historical and cultural rather than quantitative, although adequate preparation is provided for those who will teach elementary school science. Credit in PS 200, PS 205 or PS 220 precludes credit for PHS 100.

ADVANCED UNDERGRADUATE AND GRADUATE

530. **MODERN CONCEPTS IN PHYSICAL SCIENCE I (5).** LEC. 4, LAB. 3. Pr., PHS 101 or PS 206, or COL, junior standing.* General physical science based on IPS materials designed to acquaint the student with the IPS approach.
531. **MODERN CONCEPTS IN PHYSICAL SCIENCE II (5).** LEC. 4, LAB. 3. Pr., PHS 101 or PS 206, or COL, junior standing.* A survey of physics topics using PSSC and Project Physics materials designed to acquaint the students with these approaches to high school physics.
532. **NUCLEAR SCIENCE FOR TEACHERS (5).** LEC. 4, LAB. 3. Pr., a course in general physics and preferably one in chemistry plus junior standing, junior or senior high school teacher, or approval of instructor.* A course in the fundamentals of atomic and nuclear structure, designed for junior and senior high school teachers, including the study of radioactivity and nuclear radiation, radiation detection, radiological safety, nuclear fission and fusion, nuclear power reactors and power generation, advantages and hazards of nuclear power reactors.

Physics (PS)

Professors Kribel, Head, Alford, Askew, Barnes, Budenstein, Chen, Clothiaux, Fromhold, Latimer, and SwansonAssociate Professors Conner, French, Hinata, Hyder, Fukai, Kinzer, Pindzola, Simon, Thaxton, Ward, Wersinger, and Williams

Assistant Professors Gandy, Hanson, Jaronski, and Zabelka

200. **FOUNDATIONS OF PHYSICS (5).** The principles of mechanics, heat, light, sound, electricity, magnetism and selected topics. For non-science majors. Credit in PS 205 or 220 precludes credit for this course.
- 205-206-207. **INTRODUCTORY PHYSICS I, II, III (3-3-3).** LEC. 3. Pr., for PS 205, MH 160; for PS 206, PS 205; for PS 207, PS 206. Coreq., for PS 205, PS 205L, for PS 206, PS 206L, for PS 207, PS 207L. A three-quarter sequence covering topics in mechanics, fluids, heat, wave motion, sound, light, electricity, magnetism, relativity, atomic and nuclear phenomena and radiation. Quantitative as well as qualitative aspects of the subject are stressed utilizing algebra and trigonometry. Credit for the PS 220-221-222 sequence precludes credit for the 205-206-207 sequence.
- 205L-206L-207L. **INTRODUCTORY PHYSICS LABORATORY I, II, III (1-1-1).** LAB. 3. Coreq., for PS 205L, 205; for PS 206L, PS 206; for PS 207L, PS 207. Selected laboratory experiments paralleling the topics covered in PS 205, 206 and 207 respectively.
215. **ASTRONOMY (5).** LEC. 4, LAB. 3. Open to non-science majors. The planet Earth and the solar system; the stars; theories of stellar evolution, galaxies and the expanding universe; modern cosmological theories. The laboratory emphasizes studies with the telescope.
220. **GENERAL PHYSICS I (3).** LEC. 3. Coreq., MH 163, PS 220L. Mechanics using calculus. The three-quarter PS 220-221-222 serves as a foundation for students enrolled in science and engineering programs.
- 220L. **GENERAL PHYSICS LABORATORY I (1).** LAB. 3. Coreq., PS 220. Selected laboratory experiments | topics covered in PS 220.
221. **GENERAL PHYSICS II (3).** LEC. 3. Pr., PS 220, 220L. Coreq., PS 221L, MH 264. A continuation of PS 220 gravity, electricity, and magnetism.

*Not available to graduate students in the areas of science or mathematics.

- 221L. GENERAL PHYSICS II (1). LAB. 3.** Coreq., PS 221. Selected laboratory experiments paralleling topics covered in PS 221.
- 222. GENERAL PHYSICS III (3). LEC. 3. Pr., PS 221. Coreq., PS 221L.** A continuation of PS 221 including heat, light, and sound.
- 222L. GENERAL PHYSICS LABORATORY III. (1). LAB. 3.** Coreq., PS 222. Selected laboratory experiments paralleling topics covered in PS 222.
- 300-301. ELECTRICITY AND MAGNETISM (4-4).** Pr., for PS 300, PS 222, MH 269; for PS 301, PS 300, MH 501. Electrostatics, study of fields in dielectrics, magnetic forces and their effects, electric and magnetic properties of matter, Maxwell's equations, electromagnetic waves and radiation.
- 302. ELECTRONICS (5). LEC. 4, LAB. 3.** Pr., PS 222, MH 269. Review of AC and DC circuits; theory of vacuum tubes and semiconductors; diodes as rectifiers and regulators; tube and transistor voltage and power amplifiers; feedback amplifiers and oscillators; pulse and digital circuits. Appropriate laboratory exercises form a part of the course.
- 303. OPTICS (4).** Pr., PS 301, MH 501, junior standing. Intermediate course in physical optics comprising wave motion, reflection, refraction, dispersion, origin of spectra, interference, diffraction, and polarization, with appropriate laboratory experiments.
- 305. INTRODUCTION TO MODERN PHYSICS (4).** Pr., PS 222 or 206, MH 265 or 269. Introduction to relativistic kinematics and dynamics, particle aspects of electromagnetic interaction, wave aspects of material particles, structure of the hydrogen atom, many electron atoms, nuclear structure and reactions, and molecular and solid-state physics. Credit in PS 210 or 320 precludes credit in this course.
- 306. PHYSICS LABORATORY (2). LAB. 6.** Pr., PS 300, 305. Selected laboratory experiments from fields of electricity, magnetism, and modern physics.
- 320. MODERN PHYSICS FOR ENGINEERS (3). LEC. 3.** Pr., PS 222, MH 264. Introduction to modern physics, including special relativity, Schrödinger wave mechanics, atomic and nuclear systems, elementary particles. Credit in PS 210 or 305 precludes credit in this course.
- 412. SEMINAR IN MODERN PHYSICS (1).** Pr., senior standing. Library search, written reports, and oral presentation of a pertinent topic in modern physics.
- 470. HONORS THESIS (3-6).** Pr., senior standing in the honors program. May be repeated once for maximum of 6 hours credit.
- 491. UNDERGRADUATE RESEARCH (3-5). LAB. 9-15.** Pr., COI and senior standing. Each student will work under the direction of a staff member on a problem of mutual interest. May be repeated for a maximum of 15 credit hours.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. MECHANICS I (5).** Pr., MH 265. Newtonian mechanics, linear oscillations, non-linear oscillation introduction to calculus of variations.
- 502. MECHANICS II (5).** Pr., PS 501. Hamilton's principle and Lagrange's equations, central force motion, collisions, non-inertial frames, rigid body dynamics, vibrating systems.
- 504. STATISTICAL THERMODYNAMICS (5).** Pr., PS 516 or concurrently, senior standing. Temperature, entropy, and chemical potential are developed from the principles of equilibrium quantum states. The Gibbs representation is introduced and applied to the development of equilibrium distribution functions. Quantum statistics is developed and applied to problems.
- 506-507. EXPERIMENTAL PHYSICS I, II (2-2). LAB. 6-6.** Pr., PS 301, 302. Coreq. PS 303. Selected experiments from the areas of modern physics, optics, nuclear physics, plasmas, and solid state physics.
- 509. INTRODUCTION TO REACTOR PHYSICS I (5). LEC. 4, LAB. 3.** Pr., PS 305 or 320, and MH 265. Brief account of nuclear physics; basic instrumentation; interaction of neutrons with matter; chain reactions; neutron diffusion; the bare homogeneous thermal reactor; lattice constants; reactor kinetics.
- 510. INTRODUCTION TO REACTOR PHYSICS II (5). LEC. 4, LAB. 3.** Pr., PS 509. Homogeneous reactor with reflector; reactor control; power reactors; thermal aspects of reactor systems; design variables; radiation detection and measurement; shielding; radiation hazards.
- 513. INTRODUCTION TO X-RAY CRYSTALLOGRAPHY (5). LEC. 4, LAB. 3.** Pr., PS 305, COI. Principles of crystallography, the reciprocal lattice, theory of x-ray diffraction, and the powder, laue, and diffractometer methods.
- 514. ELECTRON MICROSCOPY (5). LEC. 3, LAB. 6.** Pr., PS 222 and MH 264. Electron optics; theory and operation of the electron microscope; techniques of mounting, replication and shadowing of specimen; electron diffraction, theory and interpretation of patterns.
- 515-516. INTERMEDIATE MODERN PHYSICS I, II (5-5).** Pr., MH 269, PS 305 or 320. Special theory of relativity; introductory quantum mechanics with applications to microscopic systems; Fermi-Dirac, Bose-Einstein statistics; and electronic bands in solids.
- 517. INTRODUCTION TO BIOPHYSICS (5).** Pr., COI. The physics of biological systems, with emphasis on the cellular and subcellular levels; effects of light and high energy radiations, bio-electric phenomena, bio-energetics, etc.
- 519. SCIENTIFIC INSTRUMENTATION (3). LEC. 2, LAB. 3.** Pr., PS 206, MH 162, COI. For advanced undergraduates and graduate students in the natural sciences. The course is directed to the selection and use of equipment normally used for lab experimentation in the scientific fields. Pertinent laboratory experiments will accompany the course.

520. **NUCLEAR PHYSICS AND ELEMENTARY PARTICLES (5).** Pr., PS 516. Radioactivity; nuclear radiation; nuclear forces, structure of nucleus, nuclear reactions, accelerators and reactors. A treatment of elementary particles including conservation laws, symmetry principles, decay modes and classification.
521. **MODERN ELECTRONICS (5).** LEC. 3, LAB. 6. Pr., PS 302. Network theory and digital logic; state-of-the-art electronic devices; operational amplifiers; linear and digital integrated circuits; servo systems; selected topics in modern instrumentation.
525. **PRINCIPLES OF NUCLEAR ENERGY SYSTEMS (5).** Pr., PS 305 or 320 and MH 265 or COI. Fundamental aspects of nuclear energy systems including: nuclear properties of matter, the fission process, radiation, nuclear reactor and plant design, thermal aspects of nuclear reactors, reactor control, safety analysis, licensing, isotope power sources, space applications, and fusion.
- 531-532-533. **METHODS OF THEORETICAL PHYSICS I, II, III (3-3-3).** Pr., MH 362. Theoretical methods used in classical and quantum physics, including applications of transformations, special functions, Green's functions, variation and perturbation theory, tensor and group theory.
535. **INTRODUCTION TO SOLID STATE PHYSICS (5).** Pr., PS 516, MH 264 or COI. Solid state phenomena including lattice vibrations, band description of electronic states in metals, semiconductors and insulators, and magnetic phenomena.
545. **PLASMA PHYSICS (4).** Pr., PS 301, COI or senior standing. Collision phenomena in gases, creation of ionized gases (plasmas), interaction of plasmas and fields, plasma heating, instabilities, radiation and applications.
560. **GENERAL THEORY OF RELATIVITY (4).** Pr., MH 269, PS 305 or 320, COI or junior standing. Tensor analysis by computer using the analytical language FORMAC. General theory of relativity with applications.
570. **HEALTH PHYSICS (5).** LEC. 4, LAB. 3. Pr., COI. Fundamental principles of radioactivity; instrumentation for detecting and monitoring radioactive nuclides; radiation effects on man; permissible radiation dosages; safe handling of radioactive substances; and shielding from various radiations.
590. **SPECIAL TOPICS IN ADVANCED PHYSICS (1-5).** Pr., COI. Topics will vary as needed. May be taken for credit more than once.

GRADUATE

- 601-602-603. **ADVANCED DYNAMICS I, II, III (3-3-3).** Pr., PS 502. D'Alembert's principle; introduction to the calculus of variations; Hamilton's principle and Hamilton's equations; principle of least action. Canonical variables and contact transformations; the Hamilton-Jacobi equation; action angle variables; Poisson brackets; continuous systems.
- 604-605-606. **THEORY OF ELECTRICITY AND MAGNETISM I, II, III (3-3-3).** Fall, Winter, Spring. Pr., PS 301 or EE 391, coreq. MH 607-608-609. Maxwell's formulation of classical electromagnetic theory. Includes electrostatics, magnetostatics, potential problems, electric currents, Maxwell's equations, electromagnetic waves, radiation theory, boundary value problems, special relativity.
607. **PHYSICAL OPTICS (3).** Pr., PS 606 or COI. Current topics in optics, such as Fourier optics, diffraction theory, light scattering, laser physics, optical echoes, holography, and propagation in optical waveguides.
611. **PLASMA PHYSICS I (3).** Pr., PS 301, 502 or COI. Particle interactions and orbit theory, plasma kinetic theory, Boltzmann equation, transport phenomena, Fokker-Planck equation, plasma generation and diagnostics.
612. **PLASMA PHYSICS II (3).** Pr., PS 611 or COI. Wave phenomena in plasmas, free and forced plasma oscillations, waves in anisotropic plasmas, shock waves, plasma stability, beam-plasma interactions.
613. **PLASMA PHYSICS III (3).** Pr., PS 612 or COI. Radiation processes in plasmas without magnetic fields, bremsstrahlung of transverse waves, cyclotron radiation and echoes, scattering of transverse waves.
614. **PLASMA SPECTROSCOPY (3).** Pr., PS 606, 642, or COI. Classical and quantum radiation theory, line oscillator strengths, line-broadening, equilibrium relations, temperature and density measurements.
628. **STATISTICAL MECHANICS I (3).** Pr., PS 502, 504. Theory and applications of equilibrium statistical mechanics; relation of statistical mechanics to thermodynamics.
629. **STATISTICAL MECHANICS II (3).** Pr., PS 628. Statistical mechanics of quantum mechanical systems. Introduction to non-equilibrium statistical mechanics. Boltzmann transport equation. Fluctuations and dissipation.
630. **MODERN PHYSICS FOR HIGH SCHOOL TEACHERS (5).** LEC. 4, LAB. 3. Pr., MH 587 or equivalent. Physics since 1890 including: structure of matter; atomic and molecular spectra; X-rays, natural and induced radioactivity; nuclear fission and fusion; and cosmic rays.
632. **SPECIAL THEORY OF RELATIVITY (3).** Pr., PS 602, 604. Relativistic mechanics, covariant formulation of Maxwell's field equations, Lagrangian and Hamiltonian formulation of fields.
635. **SOLID STATE PHYSICS I (3).** Pr., PS 535, 643. Electrons in a perfect crystal lattice, description of the symmetry properties of solids, Brillouin zones.
636. **SOLID STATE PHYSICS II (3).** Pr., PS 635. Cohesive energy, interaction of electrons with electromagnetic radiation, interactions between electrons and the crystal lattice.
637. **SOLID STATE PHYSICS III (3).** Pr., PS 636. Magnetic properties of solids; para-, dia-, ferro- and antiferromagnetic effects. Resonance experiments, optical properties of solids.
639. **DIRECTED READING IN PHYSICS (2).** Pr., COI. May be repeated for credit.

- 641-642-643. QUANTUM MECHANICS I, II, III (3-3-3).** Pr., for PS 641, 502; for 642, 641, and for 643, 642. Duality of particles and waves; uncertainty principle; wave functions and Schrodinger's equation; one-dimensional states; operator and matrix formalism; bound states problems; angular momentum; stationary and time-dependent perturbation theory; spin and identical problems; scattering theory; atoms, molecules and solids; interaction of radiation with matter.
- 644-645. ADVANCED QUANTUM MECHANICS I, II (3-3).** Pr., PS 643 or COI. Dirac electron; field quantization; interactions; Feynmann diagrams, dispersion relations.
- 650. BIOLOGICAL EFFECTS OF RADIATIONS (5). LEC. 3, LAB. 6.** Pr., ZY 310 or ZY 525 or equivalent, PS 205 and 206 or equivalent, or COI. (Same as ZY 650.) Summer. An introduction to radiation biology including radiation physics; radiation detection equipment; dosimetry; the effects of ionizing radiation at molecular, cellular, organ, and organismic levels, and radioprotection.
- 653. SEMINAR IN PHYSICS (2).** Pr., COI. May be repeated for credit.
- 655. SPECIAL TOPICS IN THEORETICAL PHYSICS (3).** Pr., COI. Choice of topic will vary but will include: relativity theory; group theory; atomic and molecular structure; elasticity; fluid mechanics; quantum field theory; low temperature physics. May be repeated for credit.
- 661. NUCLEAR STRUCTURE (3).** Pr., PS 505, PS 643. Selected topics on properties of nuclei.
- 662. NUCLEAR PROCESSES (3).** Pr., PS 661. Radioactive decay, nuclear reactions.
- 671-672. ADVANCED SOLID STATE THEORY I, II (3-3).** Pr., PS 637. Quantum field theory methods of solving the many-body problem, second quantization, statistical mechanics in occupation number formalism, Feynmann diagrams and infinite-order perturbation theory, Green's function propagators, "dressed" interactions and quasi-particles, many-body effects in metals, Fermi liquid theory, present-day theories of super-conductivity, ferromagnetism, and other cooperative phenomena.
- 691. DIRECTED READING IN CONTEMPORARY PHYSICS. (CREDIT TO BE ARRANGED.)** Pr., completion of 30 hours of advanced courses in physics. May be repeated for credit.
- 699. RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
- 799. RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Political Science (PO)

Professors Dickson, Hayhurst, Hobbs, and Martin

Associate Professors Johnson, Head, Gryski, Heilman, Latimer, Montjoy, Nelson,
O'Toole, Urban, and Ward

Assistant Professors Burns, Ford, Kelly, Giles, Pickering, Pendergast,
and Widell

Instructor Cannon

Adjunct Assistant Professor Wright

- 209. INTRODUCTION TO AMERICAN GOVERNMENT (5).** Constitutional principles; federalism; elections and public opinion; legislative, executive, and judicial departments; principal functions.
- 210. AMERICAN STATE AND LOCAL GOVERNMENT (5).** State constitutional principles; organization and functions of state government; national-state and state-local relations; special attention to Alabama government.
- 260. SURVEY OF LAW ENFORCEMENT (5).** Pr., sophomore standing. (Same as LE 260.) Introduction to the philosophical and historical backgrounds; agencies and processes; purposes and functions; administration and technical problems; career orientation.
- 271. HONORS POLITICAL SCIENCE (5).** Pr., admission to Auburn University Honors Program. Selected themes in American politics at the national, state, and local levels.
- 300. POLITICAL SCIENCE RESEARCH METHODS (5).** Pr., PO 209 or 210 and sophomore standing. Introduction to empirical research methods in political science with attention to computer applications.
- 302. INTRODUCTION TO POLITICAL THOUGHT (5).** Pr., sophomore standing. Selected major themes in political thought from ancient to modern times.
- 309. INTRODUCTION TO INTERNATIONAL RELATIONS (5).** Pr., sophomore standing. International relations, including a consideration of the bases of national power and the rudiments of international politics.
- 311. INTERNATIONAL ORGANIZATION (5).** Pr., sophomore standing. The evolution of international organization from the beginning through the United Nations.
- 312. INTRODUCTION TO COMPARATIVE GOVERNMENT AND POLITICS (5).** Pr., sophomore standing. Methods of classifying governments by institutional and developmental characteristics. A review of the forces which create political stability and instability, democracy and dictatorship; contemporary political systems in selected countries will be used for comparison.
- 314. AMERICAN FOREIGN POLICY (5).** Pr., sophomore standing. Analysis of the decision-making process of American foreign policy and of selected current issues of American foreign policy.
- 315. AMERICAN POLITICAL THOUGHT (5).** Pr., sophomore standing. The principal American political philosophers and philosophies and their influence on political institutions.

316. **NATIONAL SECURITY AND FOREIGN POLICY (3).** Pr., sophomore standing. Introduction to national security aspects of United States foreign policy.
318. **LATIN AMERICA AND THE UNITED STATES (3).** An analysis of Latin American-United States relations in their political, social and economic aspects.
320. **INTERGOVERNMENTAL RELATIONS (3).** Pr., PO 209 or 210 and sophomore standing. Relationships between units of local, state and national governments in structural and policy areas; federalism in theory and practice.
323. **MUNICIPAL GOVERNMENT IN THE UNITED STATES (5).** Pr., PO 210 and sophomore standing. Functions of city government, relation of city to state; electorate, party system and popular control; forms of government; administrative organizations; some reference to Alabama.
325. **INTRODUCTION TO PUBLIC ADMINISTRATION (5).** Pr., sophomore standing. Organization, development, procedures, process, and human factors involved in administration in a political environment.
326. **THEORY OF PUBLIC ORGANIZATION (5).** Pr., PO 325 and sophomore standing. The structure and functioning of governmental organizations with an emphasis on theories of administrative hierarchies and evaluation of bureaucracy.
327. **POLICY PROCESS (5).** Pr., sophomore standing. The formulation and implementation of public policy; the roles of the major governmental institutions in policy making.
328. **GOVERNMENT AND THE ECONOMY (3).** Pr., PO 325 and sophomore standing. An examination of constitutional and political bases of governmental action; the origin and evolution of policies; relationships between political and economic institutions; and the consequences of governmental action or inaction.
329. **THE AMERICAN PRESIDENCY (5).** Pr., PO 209, sophomore standing. The President as legislative leader, chief executive, chief diplomat, and commander-in-chief. Political styles and personalities of recent presidents. Presidential decision-making.
331. **THE LEGISLATIVE PROCESS (3).** Pr., PO 209 or 210, sophomore standing. The principles, procedures, and problems of lawmaking in the United States; special attention to Congress and the state legislatures.
332. **THE JUDICIAL PROCESS (3).** Pr., sophomore standing. The role of the courts; the nature of the jurisprudence; comparative legal systems; the origin of law; and the concept of legality.
333. **ADMINISTRATIVE RESPONSIBILITY (3).** Pr., PO 325 and sophomore standing. Roles and functions of public administration in a democratic society. Emphasis on bureaucratic ethics.
336. **CRIMINAL JUSTICE (3).** Pr., sophomore standing. An in depth examination of the various procedural due process rights of the Constitution as they relate to the criminal processes — historical development, modern interpretations, and further trends.
340. **POLITICAL PARTIES AND POLITICS (5).** Pr., PO 209, sophomore standing. The nature, organization, and operation of political parties in the United States; the suffrage; nominating and electoral processes; importance and nature of interest groups.
341. **PRESSURE GROUPS (3).** Pr., sophomore standing. Major private associational groups affecting public policy in the United States. Special attention to their structures, funding, public regulation, and political activities.
342. **POLITICS AND THE MEDIA (5).** Influences of the media (broadcast and printed) on political action, the electoral process and popular concepts of political institutions; "use" of the media and its regulation by government.
410. **ADMINISTRATION AND MANAGEMENT OF RECORDS (3).** Pr., sophomore standing. The principles and use of records management in the systematic analysis and scientific control of the life cycle of governmental, business and university records in terms of quantity, quality, and cost.
415. **JUVENILE JUSTICE (5).** Pr., SY 201 or COI. Analysis of the juvenile justice system with special emphasis on some of the unique issues and problems that are involved in the adjudication and rehabilitation of juvenile offenders.
450. **INTERNSHIP (5-10).** Pr., PO, PUB or HA major and junior standing. (S-U grading only.) Practical political or administrative experience in public agencies or related activities arranged and approved by the department.
451. **INTERNSHIP READING COURSE (5).** Coreq., concurrent enrollment in PO 450. COI. Content of reading by agreement of student and instructor. Not open to graduate students.
471. **HONORS READINGS COURSE (3-5).** Pr., admission to the Auburn University Honors Program or the Political Science Department Honors Program. May be repeated for a maximum of six hours but a student may earn no more than a combined total of nine credit hours in PO 452 and 453. Honors students taking an internship should select this course in lieu of PO 451.
472. **HONOR RESEARCH AND THESIS (1-3).** Pr., admission to the Auburn University Honors Program or the Political Science Department Honors Program. May be repeated to a maximum of six hours but a student may earn no more than a combined total of nine credit hours in PO 452 and 453.
475. **SPECIAL TOPICS IN POLITICAL SCIENCE (3).** Pr., PO 209. Review of selected Political Science topics.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **AMERICAN CONSTITUTIONAL LAW I (5).** The Constitution of the United States on the basis of the decisions and opinions of the Supreme Court defining judicial review, the relationship of the executive, legislative, and judicial branches of the national government, and the federal system.

502. **AMERICAN CONSTITUTIONAL LAW II (5).** The Constitution of the United States on the basis of the leading decisions and opinions of the Supreme Court defining civil rights in relation to both national and state governments.
505. **METROPOLITAN AREA GOVERNMENTAL PROBLEMS (3).** Political, governmental, and administrative organization and actions in urban areas with many governmental entities; governmental problems resulting from urbanization and possible solutions.
514. **FINANCIAL ADMINISTRATION (5).** Pr., PO 325. Theory and practice of budgeting and the review of government financial documents.
515. **PUBLIC PERSONNEL ADMINISTRATION (3).** Pr., PO 325. Personnel policies and processes of national, state and local governments. The role of politics in public personnel management.
517. **LABOR RELATIONS IN PUBLIC ORGANIZATIONS (3).** Pr., PO 515 or MN 442. The background, legal and constitutional aspects and administration of group negotiations and collective bargaining in public employment. Credit for this course precludes credit for MN 517.
518. **ADMINISTRATIVE LAW (5).** Pr., PO 325 and PO 501 or 502. General nature of administrative law; types of administrative action and enforcement; analysis of rule-making and adjudication; administrative due process; judicial review. Case method.
519. **PROBLEMS IN PUBLIC ADMINISTRATION (3-5).** Pr., COI, senior or graduate standing. Review of selected problems in public administration through readings, case studies and individual research projects.
520. **POLITICAL THOUGHT BEFORE THE NINETEENTH CENTURY (5).** The development of political thought from the Greeks to 1800; attention to the philosophers and the early theories that are found in modern political institutions.
521. **POLITICAL BEHAVIOR (5).** Pr., PO 300 or COI. An analysis of the processes of political attitude formation. Special emphasis on the development and testing of empirical theories of political culture, political socialization process, public opinion formation and participation.
522. **RECENT AND CONTEMPORARY POLITICAL THEORY (5).** The political theories of the nineteenth and twentieth centuries; analysis and comparison of modern ideologies.
523. **COMMUNIST THEORY AND PRACTICE (3).** Marxist ideology as modified by Lenin, with illustrations of actual practice drawn from all sides of the communist world.
526. **GOVERNMENTS OF WESTERN EUROPE (5).** Descriptions and analyses of the principal political structures and power systems of Western Europe with particular emphasis upon Great Britain, France, and Germany.
528. **GOVERNMENT AND POLITICS OF THE MIDDLE EAST (5).** The political environment, institutions, and processes of the Middle East countries, radicalism and conservatism in the area, the Arab-Israeli conflict, and major power interests.
533. **GOVERNMENT AND POLITICS OF THE FAR EAST (5).** The political environment, institutions, and processes of the Far East, with emphasis on China and Japan; also foreign relations of the area including Great Power interests.
535. **CONTEMPORARY INTERNATIONAL POLITICS (5).** A survey of the conflicts of national interests in contemporary international politics with special emphasis on the efforts to resolve these issues through diplomacy. This course will give students the opportunity to apply their academic training to an analysis of actual contemporary international issues.
536. **GOVERNMENT AND POLITICS OF THE SOVIET UNION (5).** The present status of the Soviet totalitarian system with attention to its origin, the essentials of the Stalinist pattern, the post-Stalinist political dynamics, and the nature and significance of contemporary changes.
537. **SOVIET FOREIGN POLICY (5).** The factors affecting Soviet foreign policy as seen in historical perspective, with emphasis on the post-war Stalinist practices and the modifications made by the post-Stalin leadership.
538. **GOVERNMENT AND POLITICS OF EASTERN EUROPE (5).** A comparative study of the political institutions of the Eastern European Communist states, emphasizing especially those features which diverge the most from the totalitarian pattern of the Stalinist era. Attention will also be given to the foreign relations of the Eastern European powers, including those with the Soviet Union and Communist China.
539. **GOVERNMENT AND POLITICS OF LATIN AMERICA (5).** The political environment, institutions, and processes of Latin America with emphasis on dynamic factors that influence the degree of democracy and authoritarianism, stability and instability, and politico-economic development in the area.
540. **INTERNATIONAL LAW (5).** The origin and development of international law with special emphasis on recent and current developments — trends.
542. **MAJOR GOVERNMENTS OF LATIN AMERICA (5).** Survey of governmental institutions and political processes in selected Latin American countries. Emphasis on Argentina, Brazil, and Mexico.
545. **POLITICS AND ADMINISTRATION OF DEVELOPING NATIONS (5).** Modernization, ideologies, system characteristics, internal stability, socio-economic development policies and the administration of development in the world's developing (Third World) nations.
552. **PROGRAM EVALUATION FOR POLITICAL SCIENTISTS AND PUBLIC ADMINISTRATORS (5).** Pr., PO 300 and junior standing. Theory and practice of action program evaluation in the public sector with attention to program planning, process assessment, and impact assessment.
590. **SEMINAR IN POLITICAL SCIENCE METHODOLOGIES (5).** Pr., senior or graduate standing. Critical review of the literature on approaches, analytical constructs, research techniques and data compilation in national and cross-national perspectives.

GRADUATE

- 600. **RESEARCH METHODS (5).** Statistics and other quantitative techniques for the analysis of policy and for administrative decision making.
- 611. **SEMINAR IN AMERICAN GOVERNMENT (3-5).** A systematic examination of functions, problems, and issues within the political and constitutional framework of selected areas of American government.
- 613. **SEMINAR IN STATE AND LOCAL GOVERNMENT (3-5).** A systematic examination of functions, problems, and issues within the political and constitutional framework of selected areas of state and local government. Some attention will be given to Alabama.
- 614. **FINANCIAL ADMINISTRATION (5).** Theory and practice in budgeting, governmental accounting, the review of financial data, and the politics of the public budgeting process.
- 615. **PUBLIC PERSONNEL ADMINISTRATION (5).** Personnel policies, processes, and politics in American governments.
- 618. **ADMINISTRATIVE LAW (5).** Analysis of administrative rule-making and adjudication, administrative due process, judicial review of administrative actions.
- 620. **INTERGOVERNMENTAL RELATIONS (5).** Political, administrative, and fiscal aspects of the relations among American federal, state, and local governments.
- 625. **SEMINAR IN POLITICAL PARTIES, PRESSURE GROUPS AND POLITICAL ISSUES IN THE UNITED STATES (5).** The interaction of political parties, pressure groups and the general public as a determinant in resolving political issues.
- 626. **ORGANIZATIONAL THEORY AND ADMINISTRATIVE BEHAVIOR (5).** The structure and functioning of government organizations. Course includes coverage of research literature.
- 633. **SEMINAR ON ADMINISTRATIVE LEADERSHIP, RESPONSIBILITY, AND DEMOCRATIC GOVERNMENT (5).** Problems of ethics, democratic theory, and leadership as they relate to public administration.
- 635. **SEMINAR IN PUBLIC ADMINISTRATION (5).** Various processes, functions, theories, practices and systems as treated in the literature of public administration.
- 636. **SEMINAR IN POLICY AND ADMINISTRATION (5).** Formation, execution, and evaluation of public policy, plus in depth analysis of selected policy areas.
- 640. **COMPARATIVE PUBLIC ADMINISTRATION (5).** The structure and functioning of public administration in representative political systems.
- 645. **SEMINAR IN COMPARATIVE GOVERNMENT (5).** The major institutions, functions, and problems of representative political systems. Includes the methodology and bibliography of comparative government and politics.
- 650. **MPA INTERNSHIP (10).** Administrative experience in a governmental agency or participation in an approved governmental research project. For students without substantial government experience.
- 655. **SEMINAR IN INTERNATIONAL RELATIONS (5).** The basic literature of the field of International Relations with special emphasis on the critical evaluation of this material.
- 660. **MPA RESEARCH PROJECT (10).** Requires the completion and approval of a paper related to a policy or administrative issue or problem. For students with substantial government experience.
- 665. **SEMINAR IN POLITICAL THEORY (3-5).** The problems of scope and methods of inquiry in the fields of political theory with intensive research in selected topics.
- 675. **SEMINAR IN CONSTITUTIONAL LAW (5).** Selected areas of constitutional law with the readings in depth in relevant cases and constitutional theory.
- 699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**

READING COURSES

Directed reading courses enable graduate students to pursue specialized topics. They require permission of the department head or graduate adviser, and the supervisory professor and may be repeated for credit. Normally a reading course in a subject should be taken after the seminar in that subject. Except by special permission no more than two reading courses may be taken in a master's program.

- 617. **READING COURSE IN AMERICAN GOVERNMENT (3-5).**
- 637. **READING COURSE IN PUBLIC ADMINISTRATION (3-5).**
- 647. **READING COURSE IN COMPARATIVE GOVERNMENT (3-5).**
- 657. **READING COURSE IN INTERNATIONAL RELATIONS (3-5).**
- 667. **READING COURSE IN POLITICAL THEORY (3-5).**

Poultry Science (PH)

Professors Moore, *Head*, Brewer, Edgar, McDaniel, Mora, and Roland
Associate Professor Giambone and Renden

- 201. **POULTRY SCIENCE (5).** LEC. 4, LAB. 2. Fall, Winter, Spring. Principles of poultry production, including breeding, feeding, housing and diseases.
- 315. **POULTRY PHYSIOLOGY (5).** LEC. 4, LAB. 2. Pr., PH 201. Fall, even years. The basic physiology and anatomy of domestic species of poultry. Attention will be given to practical applications of the material.
- 401. **JUNIOR-SENIOR SEMINAR (1).** Pr., junior standing. Fall. Experience in analyzing and presenting assigned subjects relative to the poultry industry.
- 402. **POULTRY SCIENCE INTERNSHIP (5-15).** COI, S-U graded, Fall, Winter, Spring, Summer. To provide students with practical on-the-job training in the poultry business.
- 407-409. **SUPERVISED AVIAN INVESTIGATIONS (3-3).** LEC. 1, LAB. 4. Pr., junior standing and COI. All quarters. Investigation of some phase of avian science of interest to the student.
- 410. **POULTRY BREEDING (3).** Pr., ZY 300 or COI. Spring, odd years. History, breeding systems, inheritance and selection for economic traits and influence of environment on modern breeds of poultry.
- 422. **AVIAN DISEASES (5).** LEC. 4, LAB. 2. Winter. Etiology, transmission, diagnosis, prevention and treatment of infectious and parasitic diseases. (For veterinary students only.)

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. **COMMERCIAL MEAT PRODUCTION (5).** LEC. 4, LAB. 2. Winter, even years. Principles of management of commercial poultry and meat production with major emphasis on broiler production.
- 502. **COMMERCIAL EGG PRODUCTION (5).** LEC. 4, LAB. 2. Winter, odd years. Principles of management of commercial egg production, processing and marketing.
- 505. **POULTRY FEEDING (5).** LEC. 4, LAB. 2. Pr., PH 201. Fall, odd years. Composition and use of poultry feeds in connection with the demands for body growth, body maintenance, and egg production.
- 506. **FERTILITY AND HATCHABILITY OF AVIAN SPECIES (5).** LEC. 4, LAB. 2. Pr., PH 201 or COI. Spring, even years. Fertility, artificial insemination, embryonic development, and hatchability of the avian species as it relates to hatchery operation and management.
- 508. **CONTROL OF POULTRY DISEASES AND PARASITES (5).** LEC. 4, LAB. 2. Spring, even years. Prevention, diagnosis, control and treatment of the common diseases of poultry.
- 511. **PROCESSING AND MARKETING (5).** LEC. 4, LAB. 2. Spring, odd years. Problems involved in processing and marketing poultry meat and eggs.
- 593. **PRACTICUM (1-5).** May be repeated not to exceed 10 hours credit. Not open to majors in Poultry Science. Provides students with experience in Poultry Science closely relating theory and practice, usually carried on simultaneously.

GRADUATE

- 604. **ADVANCED POULTRY PRODUCTION (5).** LEC. 5. Spring. Advanced studies on various phases of poultry production.
- 606. **ADVANCED POULTRY BREEDING (5).** LEC. 4, LAB. 2. Fall. Advanced principles of heredity as applied to poultry breeding.
- 607. **SPECIAL PROBLEMS. (CREDIT TO BE ARRANGED.)** COI, all quarters. (a) nutrition. (b) physiology, (c) path-parasitology. (d) microbiology. (e) immunochemistry. (f) management. (g) transmission EM (fall only). (h) scanning EM (fall only).
- 608. **SEMINAR. (CREDIT TO BE ARRANGED.)** Fall, Spring, Winter, Summer.
- 610. **ADVANCED POULTRY NUTRITION (5).** LEC. 4, LAB. 2. Winter, odd years. Nutrients, their function and the nutritional requirements of poultry.
- 611. **ADVANCED POULTRY MANAGEMENT (5).** LEC. 5. Summer. Principles of management of commercial poultry flocks.
- 612. **ADVANCED POULTRY DISEASES (5).** LEC. 1, LAB. 8. Pr., PH 506 or COI. Spring, odd years. Isolation, cultivation, and identification of bacterial, fungal, and viral agents. Emphasis on biochemical aspects of microbial and nutritional diseases and the mechanisms of the immune response.
- 613. **ADVANCED POULTRY DISEASES (5).** LEC. 1, LAB. 8. Pr., VM 518 and PH 612, or equivalent. Spring, even years. Continuation of PH 612 with emphasis on those disease conditions caused by protozoa, helminths, and arthropods and the gross and histopathology of diseases studied in both quarters.
- 614. **IMMUNOCHEMISTRY (5).** LEC. 3, LAB. 4. Pr., general bacteriology, immunology and organic or biochemistry. Fall, even years. Fundamental principles of immunology including specificity, antibody synthesis and the thermodynamics of antigen-antibody reactions. Laboratory will include the use of immunodiffusion, immunoelectrophoresis, fluorescent-antibody technique and quantitation of the precipitin reaction.

615. **AVIAN PHYSIOLOGY (5).** LEC. 2, LAB. 6. Pr., ZY 524 and organic chemistry. Fall, odd years. General physiology of birds with particular reference to domesticated species.
618. **EXPERIMENTAL VIROLOGY (5).** LEC. 3, LAB. 4. Pr., BY 542 and CH 520 or equivalent and COI. Fall, odd years. Properties of plant, animal and bacterial viruses including biochemical and biophysical properties and mechanisms of infection. Laboratory includes isolation, purification and fractionation of viruses; identification of anti-viral agents using in vitro systems.
620. **TRANSMISSION AND SCANNING ELECTRON MICROSCOPY (5).** LEC. 2, LAB. 6. Pr., COI, graduate standing. Spring. Theory and operation of the transmission and scanning electron microscopes, techniques in fixation, embedding, sectioning, and staining. Interpretation of ultrastructures.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** All quarters.
799. **DOCTORAL RESEARCH & DISSERTATION. (CREDIT TO BE ARRANGED.)** All quarters.

Psychology (PG)

Professors Harzem, *Acting Head*, Gynther, Hannay, Lewis, and Schaeffer
 Associate Professors Burkhart, Felner, Green, Hess, Irvine, Kelley, McCoy, Proctor, and Rogers
 Assistant Professors Benson, Buskist, Chaplin, Doerfler, Gillespie, and Stanton
 Instructor Kuhnert

211. **PSYCHOLOGY (5).** An introduction to the field of behavior.
212. **DEVELOPMENTAL PSYCHOLOGY (5).** An introduction to cognitive, social and emotional development across the life span.
213. **PSYCHOLOGY OF ADJUSTMENT (5).** The dynamics of normal interpersonal relationships and personal adjustment. Does not count toward the major in psychology.
300. **INTRODUCTION TO CLINICAL AND COMMUNITY PSYCHOLOGY (3).** Pr., PG 211. Introduction to theory and methods of clinical and community psychology.
301. **PSYCHOLOGY IN THE CRIMINAL JUSTICE SYSTEM (5).** LEC. 4, LAB. 2. Pr., PG 211. Introduction to theory, research, and applications of psychological principles in the criminal justice system.
302. **PSYCHOLOGICAL ASPECTS OF DEATH AND DYING (3).** Pr., sophomore standing. A survey of psychological literature on dying, death and grief.
314. **PSYCHOLOGY AS A SCIENCE (3).** Introduction to the use of the scientific method in psychology.
315. **QUANTITATIVE METHODS (5).** LEC. 3, LAB. 4. Pr., PG 211 and MH 140 or equivalent. Introduction to the measurement of behavior and to quantitative methods of data analysis.
320. **EXPERIMENTAL PSYCHOLOGY I: LEARNING (5).** LEC. 3, LAB. 3. Pr., PG 211 and 315. Concepts, problems, and experimental techniques in learning.
321. **EXPERIMENTAL PSYCHOLOGY II: SENSORY PROCESSES (5).** LEC. 3, LAB. 3. Pr., PG 211 and 315 or departmental approval. Discrimination, generalization, and their physical and psychological correlates.
322. **EXPERIMENTAL PSYCHOLOGY III: PERSONALITY (5).** LEC. 3, LAB. 3. Pr., PG 320. Introduction to personality with emphasis placed on the nature, description, dynamics and determinants of personality.
330. **EXPERIMENTAL PSYCHOLOGY IV: SOCIAL (5).** LEC. 4, LAB. 2. Pr., PG 211 or SY 201 and PG 212 or SY 204 or SW 375. Introduction to the field of social psychology. Laboratory work relating to investigation of social psychological problems, data collection and analysis, and report writing.
350. **BEHAVIOR MODIFICATION IN EARLY CHILDHOOD (5).** LEC. 3, LAB. 4. Pr., departmental approval. Application of learning principles to the modification of behavior in the preschool child. Laboratory practice will supplement classroom discussion.
412. **ADVANCED DEVELOPMENTAL PSYCHOLOGY (5).** Pr., PG 212 and 314 or COI. Advanced topics in developmental psychology selected from among cognitive, emotional and social processes in child and/or life-span development.
420. **PSYCHOLOGY OF WOMEN (5).** Pr., junior standing. Women from a psychological point of view covering stereotypes, roles, and origins of sex differences.
431. **SOCIAL PSYCHOLOGY (5).** Pr., departmental approval, junior standing. Social psychological processes and theories of social behavior.
433. **PERSONALITY (5).** Pr., 10 hours of psychology or departmental approval. Objective, phenomenological, and psychoanalytic theories of personality.
435. **ABNORMAL PSYCHOLOGY (5).** Pr., 10 hours of psychology or departmental approval. Types of abnormal behavior and their social and biological origins. Opportunities for field trips.
440. **PHYSIOLOGICAL PSYCHOLOGY (5).** Pr., PG 320 and 321 or departmental approval. The physiological correlates of behavior.
444. **PSYCHOLOGICAL ASPECTS OF SEXUAL BEHAVIOR (5).** Pr., junior standing. Human sexuality from a psychobiological perspective.

- 450. **LEARNING (5).** Pr., PG 320 or departmental approval. Theories of learning and their logical and empirical foundations.
- 465. **PSYCHOLOGY AND DESIGN (5).** Principles of psychology relating to the design of equipment and environments.
- 480. **HISTORY OF PSYCHOLOGY (5).** Pr., 20 hours of psychology or departmental approval. Evolution of psychology from physics, physiology, and philosophy to a science of behavior.

ADVANCED UNDERGRADUATE AND GRADUATE

- 507. **MATURITY AND AGING (5).** Pr., PG 212. Development psychology relating to changes in and problems of human maturity from early adulthood to old age.
- 515. **INTRODUCTION TO THEORY OF MEASUREMENT (5).** Pr., PG 315 or departmental approval. Theories of measurement and psychological testing with examples of their applications.
- 516. **PSYCHOLOGICAL TESTING (5).** LEC. 3, LAB. 6. Pr., PG 515 or departmental approval. Issues and applications of group assessment techniques.
- 530. **PERCEPTION (5).** Pr., PG 321 or departmental approval. Theories of perception, emphasizing both general and individual factors that influence meaning.
- 534. **PSYCHOLOGY OF EXCEPTIONAL CHILDREN (5).** Pr., PG 212. Psychological aspects of handicapped and gifted children.
- 536. **PSYCHOLOGY OF ABNORMAL CHILDREN AND ADOLESCENTS (5).** Pr., PG 212. Introduction to cognitive, emotional, and behavioral disturbances in children and adolescents.
- 545. **ANIMAL BEHAVIOR (5).** Pr., PG 320 and 321 or departmental approval. Analysis of unlearned and learned animal behavior and its evolutionary development; integrating the contributions of ethological and behavioristic research.
- 555. **HUMAN LEARNING AND MEMORY (5).** Pr., PG 320 or departmental approval. Survey of research methodology, empirical data, and theoretical interpretations relevant to the acquisition, retention and forgetting of verbal concepts and verbal materials.
- 557. **TECHNIQUES AND APPLICATIONS OF BEHAVIOR THERAPY (5).** Pr., PG 320 or 350 and departmental approval. Analysis of empirically derived therapeutic procedures and their application to socially and clinically relevant behavior.
- 561. **INDUSTRIAL PSYCHOLOGY (5).** The uses of psychology in business and industry.
- 562. **TRAINING AND SUPERVISION OF INDUSTRIAL PERSONNEL (3).** Application of the principles of learning to the training of factory, office, and sales employees.
- 563. **INTERVIEWING AND CLASSIFYING INDUSTRIAL PERSONNEL (3).** Principles and practices in interviewing.
- 590. **INDEPENDENT STUDY (1-5).** Pr., departmental approval. An individual problems course. Each student will work under the direction of a staff member on some experimental or theoretical problem of mutual interest. May be repeated for a maximum of 15 hours, but only 10 hours will count toward the major in psychology.
- 595. **SEMINAR IN PSYCHOLOGY (1-5).** Pr., departmental approval. Seminars on research and theory in various areas of psychology.

GRADUATE

- 600. **HISTORY, THEORIES, AND SYSTEMS IN PSYCHOLOGY (5).** A survey of historical developments in psychology with emphasis on the major theories and systems which have had an impact on current conceptions in psychology.
- 601. **ETHICS AND PROBLEMS OF PROFESSIONAL AND SCIENTIFIC PSYCHOLOGY (2).** Survey of ethical issues and current problems in professional and scientific psychology.
- 602. **COMMUNITY PSYCHOLOGY (5).** Historical overview of community psychology and analysis of empirical and theoretical issues in community psychology.
- 603. **SCIENTIFIC FOUNDATIONS OF PSYCHOLOGY (5).** An examination of man's attempt to understand himself and his attempts to understand the universe from the classical Greek era to the mid nineteenth-century.
- 604. **CONCEPTUAL AND THEORETICAL ANALYSIS IN PSYCHOLOGY (5).** Pr., PG 480 and PG 600 or COI. Techniques of conceptual analysis with reference to interpretation and integration of psychological data, and evaluation of alternative theories.
- 605. **DEVELOPMENTAL PSYCHOLOGY I (5).** An examination and critical analysis of research on selected topics and theories in developmental psychology.
- 606. **ADVANCED PSYCHOLOGY OF ABNORMAL CHILDREN AND ADOLESCENTS (5).** Pr., PG 601, PG 605 and COI. An examination of the current research and theory of behavioral, cognitive, and emotional disorders in childhood and adolescence.
- 607. **PSYCHOLOGICAL ASSESSMENT OF CHILDREN (5).** Pr., PG 606, 670. Psychology majors only, with supervised practicum. Introduction to the cognitive and personality assessment of infants, children, and adolescents.
- 608. **TECHNIQUES OF PSYCHOTHERAPY AND BEHAVIOR CHANGE WITH CHILDREN (5).** Pr., PG 607 and COI. Introduction to methods of prevention and treatment of cognitive, emotional, and behavioral disorders of children and adolescents.

610. **ADVANCED INDUSTRIAL PSYCHOLOGY** (5). Pr., PG 315 and 561 or COI. Analysis of major issues in industrial psychology.
611. **ADVANCED ORGANIZATIONAL PSYCHOLOGY** (5). Pr., PG 561 or COI. Analysis of major issues in organizational psychology.
612. **CLINICAL/INDUSTRIAL PSYCHOLOGY** (5). Pr., PG 610 and 611 or COI. Mental health issues in work organizations, and strategies of organizational intervention.
613. **PSYCHOMETRIC THEORY** (5). Pr., PG 515 and COI. Analysis of the mathematical models which underlie various approaches to psychological tests and measurements.
614. **INSTRUMENTATION IN INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY** (5). Pr., PG 610 and 611 or COI. Construction and use of measurement devices employed in industrial/organizational psychology.
618. **TOPICS IN INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY** (1-5). Pr., 610 and COI. In-depth analysis of specific topics in industrial/organizational psychology. May be repeated for a maximum of 15 hours credit.
619. **PRACTICUM IN INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY** (1-5). Pr., 20 graduate hours in industrial/organizational psychology and departmental approval. Individual supervised practicum in industrial/organizational psychology with an emphasis on the development of applied skills.
620. **EXPERIMENTAL PSYCHOLOGY I: LEARNING** (5). LEC. 4, LAB. 2. Pr., PG 320 or departmental approval. Analysis of learning, stressing experimental methodologies illustrative of major theoretical approaches.
621. **EXPERIMENTAL PSYCHOLOGY II: PSYCHOPHYSICS** (5). LEC. 4, LAB. 2. Pr., PG 321 or departmental approval. Physiology of receptor function and methodologies relating physical properties of stimulation to subject response variables.
622. **EXPERIMENTAL PSYCHOLOGY III: SOCIAL** (5). Pr., PG 601 or COI. Survey of Topics and literature in social psychology.
623. **TECHNIQUES IN THE ANALYSIS OF BEHAVIOR** (5). LEC. 2, LAB. 10. Pr., PG 620. Methods and techniques of operant research.
625. **RESEARCH DESIGN** (3). Methods and techniques of designing psychological research.
626. **QUANTITATIVE METHODS I** (4). Pr., PG 315 or departmental approval. The application of analysis of variance techniques to psychological data.
627. **QUANTITATIVE METHODS II** (4). Pr., PG 626. The application of regression and correlational techniques to psychological data.
628. **QUANTITATIVE METHODS III** (4). Pr., PG 627. Further applications of regression techniques to psychological data. Includes such topics as path analysis, analysis of covariance, and unequal N's analysis of variance.
629. **QUANTITATIVE METHODS IV** (4). Pr., PG 628. Application of multivariate techniques such as multivariate analysis of variance, discriminant analysis, and canonical correlation to psychological data.
630. **QUANTITATIVE METHODS V** (4). Pr., PG 627. Factor analysis, analysis of time-dependent data and other quantitative problems of interest to applied/professional psychologists.
631. **SOCIAL PSYCHOLOGY** (5). Pr., PG 531 or COI. Theories, research and issues in contemporary social psychology.
634. **GROUP BEHAVIOR CHANGE** (5). Pr., PG 637, 638 and departmental approval. Group psychotherapy and behavioral group techniques.
635. **THEORIES OF PERSONALITY** (5). Pr., PG 601. Analysis of current issues in personality theory.
636. **MOTIVATION AND REINFORCEMENT** (5). Pr., PG 600, PG 620 or COI. Recent literature on motivation and the process of reinforcement; critical review of current theories of motivation.
637. **ADVANCED PSYCHOLOGY OF ABNORMAL ADULTS** (5). Pr., PG 601. Current theoretical conceptions and research in psychopathology.
638. **SYSTEMS OF PSYCHOTHERAPY** (5). Pr., PG 635 and 637, or COI. A survey of theories and research related to modern systems of psychotherapy.
639. **PRACTICUM IN BEHAVIOR CHANGE** (1-5). Pr., PG 635, 637, 638 and/or COI. Must be taken at least four consecutive quarters. A minimum of 8 hours is required for Ph.D. in clinical psychology. May be repeated for a maximum of 20 hours. Psychology majors only. Individual supervision in psychotherapy and behavior change with emphasis on developing applied clinical skills.
640. **PHYSIOLOGICAL PSYCHOLOGY** (5). LEC. 2, LAB. 10. Pr., PG 621. Physiological basis of behavior.
645. **COMPARATIVE PSYCHOLOGY** (5). LEC. 2, LAB. 10. Pr., PG 620. Analysis of intra- and inter-species behavior emphasizing physical and physiological uniquenesses, response comparability, and generalizability, of behavioral principles.
650. **THEORIES OF LEARNING** (5). Pr., PG 620. A survey of major theories of learning.
651. **CURRENT DEVELOPMENTS IN THEORIES OF BEHAVIOR** (5). Pr., PG 550 and 650 or COI. Analysis and evaluation of current developments in theories of behavior.
652. **APPLICATIONS OF OPERANT PRINCIPLES** (5). Pr., PG 620, 623 or COI. Uses of operant principles in education, industry, economic and community-related behavior, ecological awareness and self-control.

654. **HUMAN OPERANT BEHAVIOR (5).** Pr., PG 620, 650 or COI. Critical survey of studies of human operant behavior and comparison with animal operant research.
655. **HUMAN INFORMATION PROCESSING (5).** LEC. 3, LAB. 4. Pr., PG 620 or departmental approval. A survey of the manner in which humans process information, beginning with environmental effects on the sense organs and proceeding through percepts, memories, and thoughts.
656. **BEHAVIOR MODIFICATION (5).** LEC. 3, LAB. 4. Pr. PG 601. Principles of behavior modification and practical experience to supplement classroom discussion.
657. **ADVANCED BEHAVIOR THERAPY (5).** Pr., PG 656 and/or COI. The application of behavior therapy procedures within a single-case methodological framework.
669. **OBJECTIVE TECHNIQUES OF ASSESSMENT (5).** Pr., PG 515. Theory and application of methods of objective measures of aptitudes, performance, and personality.
670. **ASSESSMENT OF INTELLIGENCE (5).** LEC. 3, LAB. 10. Pr., PG 669 and departmental approval. Theories of intelligence; supervised practice in the administration and interpretation of individual intelligence tests.
671. **PERSONALITY ASSESSMENT I (5).** LEC. 5. Pr., PG 669 and departmental approval. Theory and application of methods of personality measurements with emphasis on interview and self-report data, and on the interpretation of tests of specific behavioral deficits.
672. **PERSONALITY ASSESSMENT II (5).** LEC. 3, LAB. 6. Pr., PG 669 and departmental approval. Psychology majors only. Theory and application of methods of personality assessment with emphasis on projective techniques and supervised practicum experience.
673. **PERSONALITY ASSESSMENT III. (CREDIT TO BE ARRANGED.)** Psychology majors only. Supervised practicum in personality assessment. Maximum of 5 hours credit may be applied to minimum requirements for master's degree.
676. **TEACHING OF PSYCHOLOGY (1-3).** Pr., departmental approval. (S-U grading only.) The problems and practices of teaching psychology at the college level. In addition to seminar meetings, students will work with senior faculty in appropriate courses. May be taken more than one quarter; credit in this course cannot count toward fulfilling the minimum 45 graduate hours for a master's degree.
680. **CURRENT RESEARCH IN PSYCHOLOGY (2).** Pr., COI. Review of current research on selected topics in psychology. Six hours credit in this course required of all doctoral students. May be repeated for a maximum of 10 hours credit.
690. **SEMINAR. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter but not more than one registration permitted in any one quarter.
692. **RESEARCH IN SPECIAL TOPICS. (CREDIT TO BE ARRANGED.)** S-U grading only. May be taken more than one quarter but not more than one registration permitted in any one quarter.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be repeated for credit.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be repeated for credit.

Rehabilitation and Special Education (RSE)

Professor Eaves

Associate Professors Couch, Head, Diebold, R. McDaniel, Shinnick, Simpson, and Wood

Assistant Professors C. Brown, Burdg, Darch, Hall, McLean, and Tomlin

Instructors Haynes and Felner

Research and Extension Associates Black, Edwards, P. McDaniel, Phelps, Small, Spitznagel

****Certain sections of common offerings are identified by use of letter designations as noted below:**

(G) Gifted and Talented, (L) Learning Disabilities, (N) Speech Pathology, (O) Emotional Disturbance, (P) Mental Retardation, (Q) General Rehabilitation and Special Education, (R) Rehabilitation, and (S) Early Childhood Education for the Handicapped.

UNDERGRADUATE

- 102.** **ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfers from other curricula and students outside the dual objectives program to understand teacher education and teaching as a profession.
- 104.** **ORIENTATION TO LABORATORY EXPERIENCES FOR TRANSFER (1).**
300. **CURRICULUM PLANNING FOR THE HANDICAPPED CHILD (N-4) (5).** LEC. 4, LAB. 2. Pr., admission to Teacher Education, RSE 376, RSE 377, or RSE 378 or equivalent. This course provides students with an understanding of a functionally/developmental approach to the selection, development, implementation, and evaluation of appropriate curriculum activities for the instruction of mildly, moderately, and severely handicapped children, N-4. Content includes individualized and group approaches to curriculum.

301. **CURRICULUM PLANNING FOR THE HANDICAPPED CHILD, GRADES 5-12 (5).** LEC. 4, LAB. 2. Pr., admission to Teacher Education, RSE 376, RSE 377, or RSE 378 or equivalent. The design and implementation of appropriate curriculum modes for the handicapped in grades 5-12.
330. **CAREERS IN REHABILITATION SERVICES (5).** History, legal basis, and fields of rehabilitation services. Exploration of specialty fields in medical and vocational rehabilitation such as occupational and physical therapy, speech pathology, social work, vocational evaluation, adjustment services, and rehabilitation counseling. Emphasis on those working with disabled persons and adjustment to disability.
376. **A SURVEY OF EXCEPTIONALITY (5).** An introduction to the major categories of exceptionalities with an emphasis upon the educational and training implications of each.
377. **INTRODUCTION TO MENTAL RETARDATION (5).** Pr., RSE 376 or COI. An introductory exploration of mental retardation as a special type of exceptionality with emphasis placed upon implications for the education and training of the retarded.
378. **AN INTRODUCTION TO BEHAVIOR DISTURBANCE (5).** Pr., RSE 376 or COI. An introductory exploration of behavior disturbance as a special type of exceptionality with emphasis placed upon implications for the education and training of the behavior disturbed.
414. **ASSESSMENT TECHNIQUES IN REHABILITATION (3).** LEC. 2, LAB. 2. Pr., admission to Teacher Education and FED 320 or equivalent. Program planning principles involved in designing program activities for specific area of specialization.
415. **TEACHING AND BEHAVIORAL CHANGE IN REHABILITATION (3-5).** LEC. 2, LAB. 2. Pr., admission to Teacher Education and FED 320 or equivalent. Understanding of curriculum content, methods and techniques of instruction using appropriate instructional materials, planning and evaluation of instruction for specific area of specialization.
- 420.** **ORGANIZING INSTRUCTION FOR SPECIAL EDUCATION (5).** LEC. 4, LAB. 4. Pr., RSE 376, 378, or COI. Provides the student with skills necessary to organize the special education instructional program in area of specialization.
- 421.** **EDUCATIONAL DIAGNOSIS AND ASSESSMENT IN SPECIAL EDUCATION (5).** LEC. 4, LAB. 2. Pr., FED 400. Application of concepts in measurement and evaluation in education: Selection/Construction of instruments, collection, summation, and interpretation of diagnostic/assessment data. Emphasis is on diagnostic/assessment instruments most appropriate for referred exceptional students.
- 425.** **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to internship, appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.
- 446.** **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objective. Includes evaluation by professor and student of work accomplished at regular intervals.
- 450.** **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations.
- 479.** **METHODS AND MATERIALS FOR TEACHING IN SPECIAL EDUCATION (5).** Pr., RSE 376 and 420.
- 495.** **PRACTICUM (1-10).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

ADVANCED UNDERGRADUATE AND GRADUATE

505. **NATURE AND NEEDS OF THE GIFTED AND TALENTED (4).** Provides opportunities for students to develop knowledge about the field of gifted education and awareness of the nature and needs of high ability children. Emphasis on history, philosophy, and underlying assumptions of gifted education, identification and characteristics of high ability children.
510. **OCCUPATIONAL INFORMATION (3).** LEC. 2, LAB. 2. Pr., junior standing. (Also listed as VED 510.)
529. **LEARNING DISABILITIES (5).** Pr., RSE 376 or RSE 600 or COI, junior standing. Theoretical issues, research, diagnosis, and educational approaches involved with children with learning disabilities. Observations of educational settings for children with learning disabilities are required.
- 530.* **EVALUATION AND TRAINING IN VOCATIONAL REHABILITATION (4).** LEC. 3 HOURS DAILY FOR 6 WEEKS, INTERNSHIP 4 WEEKS. Pr., junior standing. Purposes, principles and techniques of client evaluation and training, including personal, social and physical adjustment, vocational choice and selected techniques used in the evaluation and training process.
- 531.* **RESEARCH IN EVALUATION AND TRAINING IN VOCATIONAL REHABILITATION (4).** LEC. 3 HOURS DAILY FOR 6 WEEKS, INTERNSHIP 4 WEEKS. Pr., junior standing. A problem using research techniques, to be selected in consultation with the supervising professor.
- 532.* **INSTRUCTIONAL PROGRAMS IN WORKSHOPS AND REHABILITATION FACILITIES (5).**
- 533.* **MANAGEMENT OF VOCATIONAL REHABILITATION WORKSHOPS AND FACILITIES (5).**
535. **INTRODUCTION TO VOCATIONAL EVALUATION (5).** Pr., junior standing. History, philosophy, theoretical bases, and present status of vocational evaluation. Survey of the vocational evaluation process, principles, techniques, and procedure. Innovative methodology and future trends in vocational evaluation are explored.

536. **SYSTEMS OF VOCATIONAL EVALUATION (3).** LEC. 1, LAB. 4. Pr., VED 535, junior standing. Instruction and supervised practice in the application of the GATB, the JEVS system, the TOWER system, the Singer/Graflex system and related techniques of vocational evaluation.
537. **OCCUPATIONAL ORIENTATION FOR THE DEVELOPMENTALLY DISABLED (5.)** Pr., junior standing. Principles for providing occupational orientation and work experience techniques of curriculum planning, job classification and evaluation, selection, and placement, curricular activities related to work experience, community agencies and public relations.
538. **WORK ADJUSTMENT IN REHABILITATION (5).** Pr., junior standing. 10 hrs. Psychology, 10 hrs. Rehab. Introduction to the history, development, theoretical base, and techniques of work adjustment in rehabilitation.
540. **INTRODUCTION TO MANUAL COMMUNICATION WITH THE DEAF (4).**
541. **AMERICAN SIGN LANGUAGE (4).** Pr., COI.
542. **SURVEY REHABILITATION WITH THE BLIND AND VISUALLY HANDICAPPED (4).**
543. **VOCATIONAL EVALUATION AND ADJUSTMENT OF BLIND AND VISUALLY HANDICAPPED (4).**
544. **SURVEY OF REHABILITATION WITH DEAF AND HEARING IMPAIRED (4).**
546. **VOCATIONAL EVALUATION OF DEAF AND HEARING IMPAIRED (4).**
549. **SYSTEMS OF VOCATIONAL EVALUATION FOR THE RETARDED (3).** LEC. 1, LAB. 4. Pr., RSE 535, junior standing. Instruction and supervised practice in the development, evaluation, and application of commercial systems of vocational evaluation for use with the mentally retarded.
550. **LANGUAGE DEVELOPMENT FOR THE YOUNG HANDICAPPED CHILD (5).** Pr., junior standing and COI. A systematic approach to intervention programming for communication development with handicapped children.
556. **** LEARNING RESOURCES IN AREA OF SPECIALIZATION (4).** Pr., junior standing.
580. **EDUCATION OF CHILDREN WITH SPECIAL LEARNING DISABILITIES (5).** Pr., RSE 376, RSE 529, junior standing and COI. Existing theories and instructional programs for children with special learning disabilities. Administrative arrangements, classroom management, individual educational evaluation and programming are emphasized.
585. **THE MODERATELY MENTALLY RETARDED (3).** The child functioning in the moderate mental retardation range with emphasis upon the implications for the education and training for this population.
586. **THE SEVERELY MULTIPLE HANDICAPPED (3).** Children functioning at the severe and profound mental retardation level with concomitant problems, such as behavior, sensory and physical handicaps. Emphasis will be on identification and educational programs.
587. **PARENT EDUCATION FOR HANDICAPPED CHILDREN (4).** Pr., RSE 376. Provides students with an understanding of the concerns of families with handicapped children and program options and techniques for effective communication with family members.
588. **EDUCATIONAL APPROACHES WITH HANDICAPPED INFANTS AND TODDLERS (4).** pr., 376. Provides students with an understanding of the developmental stages in infancy through two years, activities appropriate at each stage and techniques for stimulating the child who is not developing at the normal rate.

GRADUATE

600. **ADVANCED STUDY OF EXCEPTIONALITY (5).** Pr., appropriate undergraduate preparation in Special Education or COI. An advanced study of the several types of exceptionality with an emphasis upon the educational and training implications of each.
601. **ADVANCED STUDY OF EDUCATIONAL ASPECTS OF MENTAL RETARDATION (5).** Pr., RSE 376, or RSE 600, or COI. An advanced study of mental retardation as a special area of exceptionality with emphasis upon the education and training needs of the retarded.
602. **EDUCATIONAL DIAGNOSIS AND ASSESSMENT FOR SPECIAL LEARNING PROBLEMS (5).** Pr., RSE 376 and FED 661. A comprehensive study of tests and procedures for diagnosing special learning problems. In-depth instruction in educational assessment in such areas as perceptual-motor, language, academic aptitude, and achievement.
603. **PRESCRIPTIVE TEACHING FOR SPECIAL LEARNING PROBLEMS (5).** Pr., RSE 376, RSE 602 and FED 661. In-depth instruction in specialized methods of prescriptive program planning based on educational assessments of children with learning problems. Development and presentation tasks are included.
605. **INTRODUCTION TO EDUCATION OF THE GIFTED AND TALENTED (4).** Provides opportunities for students to develop knowledge about the field of gifted education and awareness of the nature and needs of high ability children.
610. **INTRODUCTION TO REHABILITATION PROGRAMS, PROFESSIONS, AND SERVICES (2).** History, parameters, career opportunities, and issues in vocational rehabilitation and roles of various professions.
625. **** INTERNSHIP (5-15).** Provides advanced students with supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled on-campus discussion periods designed to provide positive evaluation and analysis of the intern experience.
630. **DIAGNOSTIC VOCATIONAL EVALUATION (4).** Pr., PG 515 or equivalent. Process, principles, and techniques used to diagnose general assets and liabilities of the individual. Includes the functional and analysis of biographical data and the use of the evaluation interview. Emphasis is placed upon the rationale underlying the selection and use of psychometric tests in vocational evaluation.

631. **PROGNOSTIC VOCATIONAL EVALUATION (4).** Pr., RSE 630 or permission of department head. Process, principles, and techniques used to determine and predict work behavior and vocational potential. Includes the rationale underlying the selection and use of occupational exploration programs, work samples, situational tasks, simulated work experiences, and job tryouts in vocational evaluation.
632. **USE OF INTERPRETATION OF VOCATIONAL EVALUATION DATA (4).** Pr., RSE 630 and 631 or COI. Process, principles, and techniques used in the interpretation of vocational evaluation data to clients, to rehabilitation personnel, and to facility staff. Focuses upon the interpretation of data through the formal staff conference, vocational counseling, report writing, and follow-up.
634. **WORK SAMPLE DEVELOPMENT (5).** Pr., COI. Theoretical and technical principles related to the development, standardization and validation of work samples. Supervised experience in the application of work sample development principles.
643. **EDUCATION OF THE PHYSICALLY HANDICAPPED (5).** Pr., adequate courses in physiology and psychology and COI. The characteristics of major physical disabilities; the psychology of the physically handicapped; the educational objectives with curriculum adaptations; and related aspects of a total program for the physically handicapped.
644. **COMMUNICATION SYSTEMS FOR NONVERBAL HANDICAPPED CHILDREN (5).** LEC. 4, LAB. 2. Pr., RSE 600, RSE 643, or COI. Provides students with a knowledge and experience base necessary for developing, implementing, and evaluating individualized communication skill training programs for severely/profoundly handicapped children who are nonverbal.
- 646.** **DIRECTED INDEPENDENT STUDY (1-6).** Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student at regular intervals.
649. **TEACHING THE MENTALLY RETARDED (5).** Pr., RSE 376, RSE 378, and RSE 479P. Provides for observation and participation under supervision in educational programs for the mentally retarded. Lectures and discussions will implement the student's work in the classroom. Students will develop and evaluate plans and programs for the special class. (For teachers pursuing a program of education for mentally retarded children.)
- 650.** **SEMINAR IN AREAS OF SPECIALIZATION (3-10).** May be repeated for credit not to exceed 10 hours. Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.
- 651.** **RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
- 652.** **CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
- 653.** **ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
670. **EDUCATIONAL PROCEDURES FOR CHILDREN WITH BEHAVIOR DISORDERS (5).** Pr., graduate standing and COI. Analysis of current provision for children with emotional conflicts, with emphasis on educational procedures and implications for learning disabilities.
671. **CURRENT RESEARCH ON THE BEHAVIORAL DISORDERS OF CHILDREN (5).** Pr., graduate standing and COI. Examination and interpretation of research. Emphasis on educational implications of emotional conflict, classroom guidance and control.
- 695.** **PRACTICUM (1-15).** Provides advanced students with experiences closely relating theory and practice, usually carried on simultaneously.
- 696.** **GRADUATE RESEARCH FORUM (1).** May be repeated, but counted only once toward graduation. Presentations by graduate students of research proposals and/or findings. Analysis of procedures and findings.
- 699.** **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
- 798.** **FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
- 799.** **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

*Offered only to participants in training programs for workshops and facility personnel in State and Regional offices of Vocational Rehabilitation.

Religion (RL)

Professor Penaskovic, *Head*
 Assistant Professor Dawsey

- 201. **INTRODUCTION TO RELIGION (3).** Major themes in religion, including religious experience, religion and society, and the diversity of religion. Examples from various religious traditions.
- 210. **INTRODUCTION TO THE OLD TESTAMENT (5).** Historical-critical study of the Old Testament in its cultural setting. Emphasis upon development of Old Testament thought.
- 220. **INTRODUCTION TO THE NEW TESTAMENT (5).** Historical-critical study of the New Testament in its cultural setting. Major issues in New Testament study.
- 230. **HISTORY OF CHRISTIANITY (5).** Development of Christianity from 100 A.D. to the present. Major personalities, events and movements.
- 245. **THE CURRENT RELIGIOUS SCENE (5).** Religious themes and developments in contemporary American life.
- 300. **THE FIRST CHRISTIANS (3).** Literature, thought and practices of earliest Christianity.
- 301. **WORLD RELIGIONS (5).** Hinduism, Buddhism, Taoism, Confucianism, and Islam, with secondary attention to other Asian religions.
- 320. **JESUS (5).** Pr., RL 220. Jesus as portrayed in the New Testament and subsequent interpretations.
- 325. **PAUL (5).** Pr., RL 220. Life, letters and thought of the Apostle Paul.
- 335. **HISTORY OF CHRISTIAN THOUGHT (5).** Representative trends and thinkers from 100 A.D. to 1600 A.D.
- 340. **RELIGION IN AMERICA (5).** Religious activities, institutions and personalities in North America from the Colonial Period to the present.
- 350. **TWENTIETH CENTURY RELIGIOUS THOUGHT (5).** Pr., one course in religion. Major twentieth century theologians — Protestant, Catholic, Jewish.
- 365. **RELIGIOUS VALUES AND SEXUALITY (5).** Pr., one course in religion. Religious views of human sexuality from biblical times to the present. Emphasis upon contemporary period.
- 450. **SEMINAR (5).** Pr., senior standing. An intensive examination of a major topic in religious studies.
- 490. **READINGS IN RELIGION (3-5).** Pr., junior standing and COI. A program of independent study on a special topic. May be repeated for credit.

Sociology (SY), Anthropology (ANT), and Social Work (SW)

Professor Mohan

Associate Professors Adams, *Head*, Busch, French, Gundlach, Kowalski, Poole, Popple,
 Starr, Shields, and Wilke

Assistant Professors Backman, Cottier, Fauple, Waselkov, and Lewis

Instructor Morgan

Joint appointees: Professor Dunkelberger

Associate Professor Molnar

Sociology (SY)

- 201. **INTRODUCTION TO SOCIOLOGY (5).** Principles and processes of society. Open to Freshmen.
- 202. **SOCIAL PROBLEMS (5).** Pr., SY 201. A sociological analysis of current social problems such as crime, mental illness, race relations, poverty, aging, etc.
- 203. **POPULATION AND SOCIETY (5).** A survey of theories and research on how the demographic processes interact with such social institutions as the economy, education, family, medicine, science, and technology.
- 204. **SOCIAL BEHAVIOR (5).** Pr., SY 201 or PG 211. Integrated social psychological factors which influence or determine human behavior; the emphasis is upon the normal individual and/or group situations.
- 220. **STATISTICS (5).** Pr., SY 201. Basic statistical concepts, measures, and techniques used in sociological reports and research.
- 301. **SOCIOLOGY OF THE FAMILY (5).** Pr., SY 201. The American Family in perspective. Theory and method in sociological studies of the family.
- 304. **MINORITY GROUPS (5).** Pr., junior standing. Racial composition of the United States with special emphasis on the adjustment of minority groups to the core society.
- 317. **SOCIOLOGY OF MENTAL ILLNESS (5).** Pr., SY 201. Examines major sociological theories and research concerning emergence, definition and treatment of mental disorders in different cultural contexts; emphasizes role of social institutions involved.

350. **SOCIOLOGY COLLOQUIUM (1).** Pr., SY 201. Designed to orient sociology majors toward major substantive fields of the discipline. May be repeated for maximum of 3 credit hours.
370. **METHODS OF SOCIAL RESEARCH (5).** Pr., SY 201 or RSY 361. The principal methods of data collection and analysis in sociological research. Same as RSY 370. Credit in RSY 370 precludes credit in SY 370.
409. **SOCIAL THOUGHT (5).** Pr., SY 201 or COI. Focus on pre-Comtian ideas bearing on the definition and emergence of social and behavioral theory.
411. **SOCIAL CHANGE (5).** Pr., SY 201 or COI. Major theoretical and research perspectives in social and developmental change.
477. **SOCIOLOGY OF AGING (3).** Pr., SY 201. A social-cultural treatment of the phenomena of aging emphasizing recent theory and research.

ADVANCED UNDERGRADUATE AND GRADUATE

502. **SOCIAL THEORY (5).** Pr., SY 201 or COI. Survey of theorists from Comte to the present; emphasizes theory construction, theoretical analysis, and differences in theoretical approaches.
504. **SOCIOLOGY OF POWER (5).** Pr., SY 201. A systematic concern with the dimensions and distribution of power in social life.
505. **URBAN SOCIOLOGY (5).** Growth and decline of cities with special emphasis on ecological and demographic characteristics, associations and institutions, class systems, and housing and city planning.
507. **PUBLIC OPINION AND PROPAGANDA AND MEDIA (5).** Pr., SY 201. A survey of social communication emphasizing the formation, use and assessment of publics, ideologies and opinions in mass society.
508. **INDUSTRIAL SOCIOLOGY (5).** Pr., SY 201. The sociological approach to business organization and industrial relations. Emphasis given to organization principles operative in the economic life within a social system such as a factory or business establishment.
509. **SOCIOLOGY OF RELIGION (5).** Pr., SY 201 or COI. Analysis of religion as a social institution as found in the world's great religions.
511. **TECHNOLOGY AND SOCIAL CHANGE (3-5).** Pr., SY 201 or COI. Major theoretical perspectives and research accomplished in the study of social change emphasizing the introduction, diffusion and effects of new forms of technology in developing areas.
514. **FIELD INSTRUCTION (1-10).** Pr., COI. Supplementary instruction concurrent with experience in some field of work involving application of sociological perspectives to community life. May be repeated for a maximum of 10 hours credit.
515. **SOCIAL STRATIFICATION (5).** Pr., SY 201. Stratification as a fundamental feature of all societies. Past thought and current research and theory on structured social inequalities is systematically developed.
518. **SOCIOLOGY OF OCCUPATIONS (5).** Pr., SY 201. A comprehensive examination of specific occupational categories ranging from professional to service occupations. Special emphasis is placed on the relationship of occupational structure and institutions and the meaning of occupations for individuals and society.
520. **RACIAL AND ETHNIC RELATIONS (5).** Pr., 10 hours of SY or COI. Utilizes cross-cultural data to describe situations in which race or ethnicity affect human behavior. These data interpreted by delineating patterns, trends, and relationships.
522. **SPECIAL TOPICS IN SOCIOLOGY (1-5).** Pr., SY 201 or COI. Examines selected topics from a sociological perspective. May be repeated for a maximum of 10 hours.
525. **SOCIAL DEVIANCE (5).** Pr., SY 201 or COI. Analysis of factors in the creation of and reaction to social deviance. Examines various theoretical approaches to deviance, with particular emphasis on how behavior comes to be defined as deviant.
534. **SOCIALIZATION (5).** Pr., SY 201. Examines an important and distinct sociological tradition: mind, self, society and interaction as symbolic phenomena grounded in social processes. Covers major intellectual influences, concepts, and figures (e.g., James, Mead, Cooley).
550. **DIRECTED READING (1-5).** Pr., COI. An independent reading program, under supervision, to provide for the pursuit of specific interests in sociology not covered by other course offerings. May be repeated for a maximum of 10 hours credit.
577. **SEMINAR IN MEDICAL SOCIOLOGY (5).** Pr., SY 201 or COI. The nature and organization of medical practice and health delivery systems. Special attention to role of physicians and various views of patients and disease. Relationship between culture, politics, and health.

GRADUATE

602. **SEMINAR IN THE FAMILY (5).** Pr., SY 301 or COI. Study of the institutions of marriage, family, and kinship from a comparative and historical perspective.
603. **SOCIAL PROBLEMS (5).** Pr., SY 202 and COI. Special social problems such as old age, crime and delinquency, minorities, etc., within the framework of social problem theory.
604. **SEMINAR IN RACE AND CULTURE (5).** Pr., SY 201 and 304 or COI. Adjustment of races to culture with particular reference to the South; the historical and cultural background of the races in America; bi-racial system; problems of race relations.

608. **ORGANIZATIONAL ANALYSIS (5).** A theoretical and empirical examination of the principal features of large-scale organizations in contemporary society. Directed research into particular organizational areas of present-day social life.
610. **SEMINAR IN SOCIAL BEHAVIOR (5).** Pr., SY 204, PG 330, or COI. Research and theory concerning social and group influences on behavior.
615. **SEMINAR IN SOCIAL INEQUALITY (5).** A review and research on the nature, causes and consequences of social and economic inequality. Special attention is given to poverty.
620. **ADVANCED SOCIOLOGICAL THEORY (5).** Pr., COI, SY 502. This course reviews principal types of sociological theory, exchange theory, and structural functionalism. It focuses on significant theoretical issues.
630. **STATISTICAL APPLICATIONS IN SOCIOLOGICAL RESEARCH (3-5).** Pr., SY 220 or COI. A general survey of uses and limitations of statistical techniques used in sociology.
650. **SOCIOLOGY SEMINAR (5).** Pr., COI. May be taken for a maximum of 15 hours. Designed for students engaged in intensive study and analysis of sociological subject areas. May be repeated for a maximum of 10 credit hours.
661. **SOCIOLOGY OF REGIONS (3).** Social and demographic phenomena having implication for regional planning and development with emphasis on Southern region and subregions. Intra- and inter-regional influences, sociocultural structure, value orientations, population, changes and trends, and metropolitanization.
680. **INDEPENDENT STUDY (1-5).** Under supervision, to read and study materials in some substantive area of sociology.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be repeated for credit.

RURAL SOCIOLOGY

(For course descriptions, see Department of Agricultural Economics and Rural Sociology.)

261. **RURAL SOCIOLOGY (5).** Credit not allowed in this course and SY 201.
362. **COMMUNITY ORGANIZATION (5).**
370. **METHODS OF SOCIAL RESEARCH (5).** Pr., RSY 261 or SY 201.
371. **APPLIED RESEARCH METHODS AND PROGRAM EVALUATION (3).** Credit not allowed in this and in RSY or SY 370.
499. **DIRECTED STUDIES IN RURAL SOCIOLOGY (1-5).** Pr., COI.
541. **EXTENSION PROGRAMS AND METHODS (5).**
561. **RURAL SOCIAL ORGANIZATION (5).**
562. **SOCIOLOGY OF COMMUNITY DEVELOPMENT (5).**
565. **SOCIOLOGY OF NATURAL RESOURCES AND ENVIRONMENT (3).**
670. **RESEARCH METHODS IN SOCIOLOGY (5).**

ANTHROPOLOGY (ANT)

203. **INTRODUCTION TO ANTHROPOLOGY (5).** Pr., sophomore standing. The anthropological perspective from the four major fields of anthropology: physical, cultural, archaeological, and linguistic.
206. **CULTURAL ANTHROPOLOGY (5).** Pr., ANT 203. The nature of culture. Comparative approach to the study of the principal institutions of human society and basic categories of human behavior.
207. **INTRODUCTORY ARCHAEOLOGY (5).** The history, principles, and methods for investigating and reconstructing past cultures.
303. **HISTORY OF ANTHROPOLOGICAL THEORY (5).** Pr., ANT 203. The development of ethnological theory.
305. **CULTURE AND PERSONALITY (3).** Pr., SY 201 or ANT 203. Socio-cultural factors in personality development and recent studies in national character.
306. **INTRODUCTION TO PHYSICAL ANTHROPOLOGY (5).** LEC. 3, LAB. 3. Pr., ANT 203. Human origins and development; contemporary primate varieties, using a genetic and anthropometric approach.
314. **ANTHROPOLOGY OF WORK (3).** Pr., Junior standing. Anthropological theory and data applied to problems of various work settings.
340. **ARCHAEOLOGICAL FIELD SCHOOL (5-10).** Pr., COI. A field methods course, in which archaeological site surveying, excavation and analysis procedures are taught with student participation in directed research projects at a selected archaeological site.
401. **KINSHIP, MARRIAGE AND THE FAMILY (5).** Pr., ANT 203 or SY 301. The comparative study of human patterns of marriage, child rearing, inheritance, descent and kinship.
403. **CONTEMPORARY ANTHROPOLOGY (5).** Pr., ANT 203, junior standing. Contemporary research and theory regarding primitive, traditional, and urban cultures.

ADVANCED UNDERGRADUATE AND GRADUATE

511. **LANGUAGE AND CULTURE (5).** The social basis of verbal communication; functions of language in society; importance of language in contemporary social problems.
512. **GENERAL ETHNOLOGY (5).** Surveys ethnological data from several societies in order to provide an understanding of the range and variability of cultural phenomena.
524. **SPECIAL TOPICS IN ANTHROPOLOGY (1-5).** Pr., ANT 203 or COI. Examines selected topics from an anthropological perspective. May be repeated for a maximum of 10 hours.
531. **SOUTHEASTERN ARCHAEOLOGY (5).** Pr., ANT 207. A survey of the findings of archaeologists working southeastern North America, detailing the diversity and complexity of prehistoric Indian cultures in the region.
532. **INDIANS OF NORTH AMERICA (5).** Aboriginal cultures of North America. Effects of culture contact. Contemporary problems of Indian communities.
534. **MESOAMERICAN ARCHAEOLOGY (5).** Pr., ANT 207. A survey of the prehistoric cultures of Mexico and Central America, with particular emphasis on the Olmec, Toltec, Maya and Aztec cultures.
540. **HISTORICAL ARCHAEOLOGY AND ETHNOHISTORY (5).** Pr., COI. A review of the methods and findings of these two subfields, with emphasis on anthropological approaches to the past culture and history of peoples who left few written records: slaves, Indians, lower classes.
550. **DIRECTED READING (1-5).** Pr., COI and junior standing. An independent reading program, under supervision, to provide for the pursuit of specific interests in anthropology not covered by other course offerings. Can be repeated for a maximum of 10 hours credit.
612. **SPECIAL TOPICS IN ETHNOLOGY (5).** Pr., COI. An intensive study of peoples and cultures from a particular geographical area of cultural adaptation.

CRIMINOLOGY (SCR)

302. **CRIMINOLOGY (5).** Pr., SY 201, junior standing. The causes of crime and its social treatment.
308. **JUVENILE DELINQUENCY (5).** Pr., SY 201. Historical and contemporary considerations relative to the juvenile offender. The emphasis is upon research data from the various sciences attempting to deal with the problem.
415. **JUVENILE JUSTICE (5).** Pr., SY 201 or COI. Analysis of the juvenile justice system with special emphasis on some of the unique issues and problems that are involved in the adjudication and rehabilitation of juvenile offenders.
420. **PROBATION AND PAROLE (5).** Pr., SY 201 or COI. An introduction to the fields of probation and parole. Following a brief discussion of the historical development, the course will attempt to acquaint students with current theories, practices, organizational goals and problems with both adult and juvenile probation and parole programs.
426. **PENOLOGY (5).** Pr., SY 201 or COI. The history and development of corrections with particular emphasis upon modern rehabilitative processes.
450. **SOCIOLOGY OF CRIMINAL LAW (5).** Pr., SY 201 or COI. Examines how and under what conditions behavior comes to be defined as criminal and how legal codes interact with other normative systems in society.
514. **FIELD INSTRUCTION IN CRIMINOLOGY (1-10).** Pr., COI. Supplementary instruction concurrent with experience in some field of work related to Criminology. May be repeated for a maximum of ten hours credit.
530. **CONTEMPORARY CORRECTIONS (5).** Pr., SCR 302 or 426 or COI and junior standing. Examination of current adult correctional programs and practices. Emphasis on community corrections.
555. **DIRECTED READINGS IN CRIMINOLOGY (Variable Credit).** Pr., COI. An independent reading program, under supervision, to provide for the pursuit of specific interests in criminology not covered by other course offerings. May be repeated for a maximum of 10 hours credit.

SOCIAL WORK (SW)

320. **SOCIAL WORK FIELD PRACTICUM (1-5).** Pr., COI. An introduction to the fields, methods, and settings of social work practice through an internship in a selected social work setting. This course stresses a basic understanding of social service organizations. Students work under the joint supervision of the placement agency and the university. A seminar is held regularly to evaluate, discuss and interpret the student's work. Social Work majors must earn 4 hours credit. May be taken by any major for a maximum of 5 hours credit.
375. **INTRODUCTION TO SOCIAL WELFARE (5).** Pr., sophomore standing. The development of U.S. social welfare programs, policies, and services. Emphasizes political, economic, and social factors involved. Introduction to health and welfare services of local community.
376. **COMMUNITY SOCIAL SERVICES (5).** A review of the social services available in a typical community in areas of health, income, housing, crises, child welfare, legal and mental health. Addresses procedures in linking clients with services and work with blacks, the aged, families, and groups.
377. **CHILD WELFARE (5).** Reviews practice in child abuse and neglect, foster care, child care and adoptions. Addresses work with blacks, court procedures, and worker stress. Opportunity for experience.
380. **FOUNDATIONS OF SOCIAL WORK (5).** Pr., SY 201. The integration of social science perspectives for the social work student. Surveys interpretations of biological, socio-psychological, and cultural determinants of behavior for social work practice.

385. **AGING ISSUES AND SERVICES (2-5).** Pr., SY 201, SW 375, or COI. Reviews social services and social work with elderly, and issues in economics, religion, health, mental health, politics, mass media education, biology, housing, nutrition, and recreation. Field work option.
426. **SPECIAL TOPICS IN SOCIAL WORK (1-5).** Pr., SY 201 or COI, junior standing. Examines selected topics from a social work perspective. May be repeated for a maximum of 10 hours credit.

ADVANCED UNDERGRADUATE AND GRADUATE

506. **SOCIAL WORK METHODS I (5).** Pr., SW 375, SW 380 and admission to social work program or COI. The first in a sequence of social work practice method courses focusing on the application of knowledge value and skill in carrying out a problem-solving, systems oriented approach with clients at the individual, small group, organization and community level. Emphasis on application of research, process of social change, non-judgmental practitioner stance and regard for cultural, racial, age and lifestyle variations.
507. **SOCIAL WORK METHODS II (5).** Pr., SW 506. Continuation of SW 506.
508. **SOCIAL WORK METHODS III (3).** Pr., SW 507. Continuation of SW 506.
520. **SOCIAL WORK FIELD PLACEMENT (1-15).** Pr., SW 508, and COI. A planned field experience in which the student is placed in a community service agency, working under the joint supervision of the agency and the University. A seminar is held regularly to evaluate, discuss, and interpret the student's work.
575. **SOCIAL WELFARE POLICY (5).** Pr., SW 375 or COI. Current problems, policy issues, and proposals in selected social welfare programs are critically examined and evaluated.

Speech Communication (SC)

Professors Bradley, Head, Barker, and Richardson

Associate Professors Overstreet and Solomon

Assistant Professors Brown, Gibson, Reeves, Sanders, and Villaume

Instructors Himes and Pierce

COMMUNICATION THEORY/RHETORIC AND PUBLIC ADDRESS

- ✓ 200. **INTRODUCTION TO UNDERGRADUATE STUDY IN SPEECH COMMUNICATION (5).** Acquaints the prospective speech major or minor with the fundamentals of speech, the historical, psychological, sociological, and other bases of speech.
202. **APPLIED SPEECH COMMUNICATION (3).** To improve the effectiveness of the human communication in one's daily life. Explores interviewing and oral reporting, and involves experiments with speech communication variables.
203. **VOICE AND ARTICULATION (3).** Provides a body of knowledge about voice production and articulation (articulation, pronunciation, and intonation) for persons interested in knowing what the productive act of speaking is about and applying this knowledge to the improvement of their own speech.
204. **INTRODUCTION TO PUBLIC RELATIONS (5).** The broad spectrum of the field of public relations. The various communication skills and technologies necessary for successful public relations will be identified and explored. Credit for this course precludes credit for JM 204.
211. **PUBLIC SPEAKING (5).** Content, organization, style, delivery, adaptation to the audience, ethics, and criticism. Theory and practice, composition and delivery of original speeches.
- ✓ 273. **GROUP PROBLEM SOLVING THROUGH DISCUSSION (5).** Group problem solving through discussion. The values and limitations of discussion, the prerequisites of reaching agreement, and a systematic approach to solving problems in group discussion. Leadership in problem solving.
275. **DEBATE WORKSHOP (1).** Introduction to the national debate question for beginning debaters interested in competition debate. Lecture and practical work. May be repeated for a maximum of 3 credit hours.
301. **SPEECH COMMUNICATION THEORIES (5).** The nature, purposes, and process of oral communication. Theories of language, goals of various forms of oral communication are considered. Deviations from normal speech and special problems in communication are explored.
- ✓ 328. **INTERPERSONAL COMMUNICATION (5).** An analysis and comparison of several approaches to the study of current problems in interpersonal behavior and relational communication. Topics will include: contexts of varying person perception; interpersonal attraction; and how person perception is related to behavior.
340. **LEGAL COMMUNICATION (5).** Three communication subjects of significance to the legal profession are treated; the initial lawyer/client interview, legal negotiation, and trial practice. The theory and research base of these three topics will be investigated, and practicum exercises will assist student development of needed skills.
343. **COMMUNICATION SKILLS IN ORGANIZATIONS (5).** Focuses on prevalent communication skills in complex human organizations. Students participate in a variety of communication-related activities including interviewing, the development of a consulting prospectus, and presentational speaking. Theoretical considerations for each performance area are stressed.
371. **PARLIAMENTARY PROCEDURE (1).** To aid the individual who may lead or participate in discussions or organizations where orderly procedure is needed. Theory and practice both employed.

375. **DEBATE WORKSHOP (1).** Advanced national debate question for experienced debaters. Analysis of logical, emotional proofs in competition debate. Lecture and practical work. May be repeated for a maximum of 3 credit hours.
378. **ARGUMENTATION AND DEBATE (5).** Debating techniques and procedures; their application to issues of current public interest; the gathering, organization, and presentation of facts, proofs, evidence.
400. **HONORS THESES (3-6 hours).** Repeatable once for maximum of 6 hours credit. Pr. senior standing and enrollment in Honors Program.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **PSYCHOLOGY OF COMMUNICATION (5).** Pr., one course in psychology. Speech as a psychological phenomenon with consideration of language development, symbolism, verbal learning. Small groups and audience behavior and psychological studies in various areas of communication situations.
503. **NONVERBAL COMMUNICATION (5).** Research and theory in several areas of non-verbal communication including kinesics, proxemics, paralinguistics, environment, and personal appearance.
504. **PUBLIC RELATIONS CASE STUDIES AND PROBLEM SOLVING (5).** Pr., SC 204, or JM 204, or COI. Investigation and analysis of public relations problems through case studies, and an application of necessary skills and techniques in solving public relations problems. Credit for this course precludes credit for JM 504.
505. **SURVEY RESEARCH METHODS IN MASS COMMUNICATION (5).** Theory and practical experience in methods of survey research in mass media and public relations. Sampling techniques, interview strategies, questionnaire development, and data analysis.
508. **SPECIAL TOPICS IN SPEECH COMMUNICATION (1-5).** Examines selected topics in Speech Communication. May be repeated; only 5 hours applicable to the major.
509. **SOCIAL DIALECTS (5).** Investigates origin and nature of different dialects of American English. Focuses on the characteristics and causes of social dialects and the problems encountered in our society because of their existence. Particular emphasis will be placed on social dialects in Alabama.
510. **COMMUNICATION STRATEGIES OF SOCIAL MOVEMENTS (5).** An examination of the communication techniques of contemporary social movements to attract members, solidify support and effect social change. Topics to be covered include: stages of development of movements; issues, persuasive strategies and stylistic devices of representative groups; and, nature and impact of social movements.
511. **PERSUASIVE SPEAKING (5).** Pr., SC 211 or COI. Understanding, practicing, and analyzing persuasion. Survey of alternative theoretical approaches to attitude formation and change. Practical experience in organizing and presenting persuasive messages. Developing skills as a critical evaluator of persuasion in natural settings.
512. **COMPUTER APPLICATIONS TO COMMUNICATION THEORY AND RESEARCH (5).** Applies computer simulation techniques to the process of message construction, diffusion of information, small group interaction and organizational network analyses. Course also utilizes statistical packages in the testing of the communication dependent hypotheses.
573. **LEADERSHIP COMMUNICATION IN SMALL GROUPS AND ORGANIZATIONS (5).** Emphasizes theory and research in leadership as a communication variable and behavioral practice in small group and organizational settings. Students participate in numerous leadership simulations.
578. **DIRECTING FORENSICS (5).** An examination of the various philosophies of forensic programs. Representative forensic situations; leading theories.

GRADUATE

601. **INTRODUCTION TO GRADUATE STUDY IN SPEECH COMMUNICATION (1).** Explanation of graduate school requirements and procedures; introduction to professional associations; study of relevant style manuals; development of a research prospectus.
602. **MEASUREMENT IN COMMUNICATION RESEARCH (5).** Response measurement techniques and their application to behavioral research in communication. Particular attention to attitudinal and electrophysiological phenomena.
- 603-604. **DEVELOPMENT OF RHETORICAL THEORY I, II (5-5).** Pr., COI. Historical study of the theories of persuasion from ancient to modern times. Special attention to the role of rhetoric in society and changing attitudes toward persuasion.
606. **SEMINAR: STUDIES IN COMMUNICATION THEORY (5).** Contemporary theories and analysis of concepts, models and pertinent research in interpersonal communication. Consideration of selected topics.
607. **INDEPENDENT STUDY (1-5).** Prior written approval required. Conferences, readings, research, and reports in one of the listed categories. May be repeated for a maximum of 5 hours credit.
608. **SEMINAR IN PERSUASION AND ATTITUDE CHANGE (5).** A critical examination of current theory and research in the area of the persuasive act and its effects. Particular attention to current departmental projects as examples of present research.
610. **SEMINAR IN INSTRUCTIONAL COMMUNICATION (5).** Critical analysis of teaching and research issues involving communication in the classroom. Processes associated with the impact of communication on learning.
611. **BRITISH PUBLIC ADDRESS (5).** Pr., COI. An analysis of the speakers and issues representative of the period 1600-1840 in Great Britain, including the foundations of British public address.

- 612. **EXPERIMENTAL METHODS IN COMMUNICATION (5).** A survey and analysis of experimental and empirical research in communication with emphasis on experimental designs.
- 613. **AMERICAN PUBLIC ADDRESS I (5).** Criticism of selected speakers, and speeches, 1750-1860, studied against a background of political, social, and intellectual issues.
- 614. **AMERICAN PUBLIC ADDRESS II (5).** Criticism of selected speeches and speakers, 1860 to present, studied against a background of political, social, and intellectual issues.
- 615. **RHETORICAL CRITICISM (5).** Pr., COI. Methods of analyzing persuasive messages of individuals, groups and movements. Application of these methods to selected works.
- 626. **INTERPERSONAL COMMUNICATION THEORY (5).** Theory and research in the process and effects of interpersonal communication.
- 672. **SEMINAR IN SMALL GROUP COMMUNICATION (5).** Principles of human communication as they apply to the small group setting. Processes associated with group decision-making.
- 673. **SEMINAR IN GROUP AND ORGANIZATIONAL COMMUNICATION (5).** Group decision-making within an organizational setting. How groups effect change within functioning organizations. Processes associated with the diffusion of innovations.
- 678. **SEMINAR IN ARGUMENTATION AND DEBATE (5).** Systems of argumentation as inquiry and advocacy; studies of debate as a decision making procedure; representative argumentation theorists and leading practitioners.
- 698. **SEMINAR IN SPEECH COMMUNICATION (5).** Advanced treatment of contemporary topics and trends as well as current research findings and opportunities. May be repeated for credit with change in topics.
- 699. **THESIS. (CREDIT TO BE ARRANGED.)**

INTERPRETATION

- ✓ 320. **FUNDAMENTALS OF ORAL INTERPRETATION OF LITERATURE (5).** Oral readings of prose, poetry and drama, enhancing the student's understanding and appreciation of the art of literature by engaging him actively in reading the literary text aloud.
- 521. **ORAL INTERPRETATION OF PROSE (5).** Pr., SC 320 or COI. Develops skill in the oral reading of creative prose. Theories concerning the sound, sense, and performance of prose.
- 522. **ORAL INTERPRETATION OF POETRY (5).** Pr., SC 320 or COI. Theories concerning problems in reading verse, criticism and performance; modes of group performance are included.
- 523. **READERS THEATER (5).** Pr., SC 320 or COI. Investigates literature appropriate to group performance and treats the techniques of adaptation, compilation, rehearsal and staging of non-dramatic literature.

GRADUATE

- 620. **DEVELOPMENT AND THEORY OF INTERPRETATION (5).** The growth and change of theories regarding oral interpretation.

TELECOMMUNICATION

- ✓ 230. **INTRODUCTION TO TELECOMMUNICATIONS (5).** The history, growth, and development of telecommunications, encompassing radio, television, cable, and satellite technology. Study of social, legal, ethical and public policy issues involved in the practice of telecommunications.
- ✓ 235. **MODES OF FILM COMMUNICATION (5).** The film industry's contribution to television and other forms of mass communication; an analysis of the styles and forms of film production as entertainment, communication, education and art.
- ✓ 333. **MEDIA STANDARDS, ETHICS, AND REGULATIONS (5).** Examines legal, professional, and ethical constraints on the mass media.
- 334. **RADIO PRODUCTION TECHNIQUES I (5).** Pr., COI. Analysis of the creative efforts and responsibilities in the primary stages of broadcast production. Practice in writing, producing, directing, performing, and crewing radio productions and taped material.
- ✓ 335. **CINEMA AND SOCIETY (5).** Pr., SC 235 or COI. The role of film, its history, contributions and effectiveness as an area of expression and communication; an analysis of the social, artistic, economic and cultural factors which have influenced the film.
- 336. **TELEVISION PRODUCTION — DIRECTION I (5).** Pr., COI. Individual and group projects in the development and production of programs and formats; an intense study of directing theory and the director's role through presentation of educational and dramatic materials.
- 337. **FILM PRODUCTION I (5).** Pr., SC 235 or COI. Theory and principles of film making. Special instruction given through practical application of silent film to the problems of production planning, writing, direction, cinematography, and editing.
- 338. **BROADCAST NEWS WRITING (5).** Pr., COI. Writing and editing news and informational materials for television and radio. Students solicit and prepare news from and for local sources.
- 339. **BROADCAST MANAGEMENT (5).** Investigates principles and practices of managing broadcasting stations and cable operations.

- 431-432. **MASS COMMUNICATION WORKSHOP (3-3).** Pr., SC 230, 235, 336, and departmental approval. S-U grading only. Experience as a part-time staff member with an approved local station or production company.
531. **THE SOCIAL INFLUENCE OF MASS COMMUNICATION (5).** Functions and effects of mass communication on contemporary social norms and values. The impact of the media on the level of violence and aggressive behavior; the nature of the political process; and individual attitudes and behavior.
534. **RADIO PRODUCTION TECHNIQUES II (5).** Pr., SC 234 or COI. A continuation of SC 234 with further refining of writing, producing, directing, performing and crewing radio productions and audio taped material.
536. **TELEVISION PRODUCTION — DIRECTION II (5).** Pr., SC 336. Individual and group projects in the creation of program material with special emphasis on the writer-producer and his role in the industry.
537. **ELECTRONIC FIELD PRODUCTION (5).** Pr., COI. The principles and techniques of video tape production with emphasis on portable and remote equipment. The course includes the production and direction of electronic news gathering projects along with the scripting of various creative field assignments.
538. **TELEVISION — RADIO — FILM WRITING (5).** Pr., COI. The technique of writing dramatic and non-dramatic material for television, radio, and films. Special emphasis is placed on performance. Students may elect to emphasize one area.
539. **INTERNSHIP (6).** Pr., departmental permission and junior standing. S-U grading only. Credit toward requirements for major may not be granted for both SC 539 and SC 431-432.

GRADUATE

605. **PUBLIC RELATIONS THEORY (5).** Explores major areas of concern to the theoretical study of public relations. Includes: applied survey research; public relations with business, government, and non profit organizations; propaganda techniques and diffusion of information.
630. **STUDIES IN MASS COMMUNICATION (5).** Pr., COI. Combined media and their relationship with speech and communication.
631. **DEVELOPMENT OF AMERICAN BROADCASTING (5).** Pr., COI. The origin of radio and television broadcasting and its development to the present day.
632. **BROADCAST PROGRAMMING AND CRITICISM (5).** Pr., COI. The theory and practice of programming, its problems and concepts, coupled with an analysis of the criticism leveled at the process and the product.
633. **BROADCAST REGULATIONS (5).** The social and political control of broadcasting by agencies, groups, and organizations through legal, social, and economic means.

Textile Engineering (TE)

Professors Lynch, Head, Hall, Perkins, and Waters
Associate Professors Broughton, and Walker

General Curriculum, GC, students (those with undeclared majors) may enroll only with departmental consent.

BASIC TEXTILES

101. **INTRODUCTION TO TEXTILE ENGINEERING (3).** An introduction to the textile industry. The industry, its products, business and manufacturing structures, careers and education programs.
141. **TEXTILE CHEMISTRY (5).** LEC. 4, LAB. 2. Coreq., TE 101. The discipline of science is presented to assist the student in making the transition from secondary to post secondary study of the physical sciences. Production and modification of textile products with chemistry.
211. **YARN FORMING SYSTEMS (5).** LEC. 4, LAB. 2. Pr., TE 101. Forming of staple and filament yarns. Interactions between raw materials and manufacturing systems that create specified product characteristics.
221. **FABRIC FORMING SYSTEMS (5).** LEC. 4, LAB. 2. Pr., TE 101. The basic forming systems for textile fabrics including knit, woven and non-woven structures.
231. **TEXTILE FIBERS I (5).** LEC. 4, LAB. 2. Pr., TE 141. Natural and man-made fibers, their production, structure and properties. The relationship between polymeric fibrous materials, end products and utilization.

INTERMEDIATE TEXTILES

212. **SPECIAL TOPICS IN YARN MANUFACTURING (4).** LEC. 3, LAB. 2. Pr., all Basic Textile Courses. An extension of TE 211. Mechanics of yarns, geometry and properties of yarns as influenced by processing techniques. Both conventional and non-conventional processes are explored.
213. **PREPARATION OF YARNS FOR FABRIC FORMING (2).** LEC. 2. Pr., all Basic Textile Courses. Yarn packaging and sizing for further processing; chemistry of sizing materials; management aspects of yarn preparation and effects on yarn properties and process efficiency are covered.
222. **WOVEN STRUCTURES (3).** LEC. 2, LAB. 2. Pr., all Basic Textile Courses. Looms and loom mechanisms are covered including cam, dobby, jacquard and shuttleless machines. The principles of operation, process efficiency and fabric quality are emphasized. Constraints of each system are included.

232. **TEXTILES FIBERS II (5).** LEC. 4, LAB. 2. Pr., all Basic Textile Courses. An extension of Textile Fibers I. Provides an indepth analysis of physical and chemical structure and resulting properties of textile fibers. Application of fiber theory to practical manufacturing situations.
241. **DYEING AND FINISHING OF TEXTILE MATERIALS (5).** LEC. 4, LAB. 2. Pr., TE 141; Coreq., CH 104. Emphasis on principles and techniques to modify textile materials by coloration, additives and surface treatment. The chemistry of these phenomena is studied.
242. **CHEMICAL TECHNOLOGY OF BLEACHING, DYEING AND FINISHING (3).** LEC. 2, LAB. 2. Pr., all Basic Textile Courses, TE 241. Bleaching, dyeing and finishing of fabrics made from natural and man-made fibers; dyes and pigments for textiles, their chemical structure and utility.
311. **TEXTURIZED YARNS (2).** Pr., all Basic Textile Courses. Methods and principles of science applied to the modification of continuous multifilament textile yarns to alter their characteristics. Preparation of textured and non-textured yarns is presented.
321. **KNIT STRUCTURES (3).** LEC. 2, LAB. 2. Pr., all Basic Textile Courses. Principles involved in the formation of knit structures. The scope of capability-design and mechanical constraints, quality and relation between input materials and product characteristics is included.
322. **NON CONVENTIONAL FABRIC STRUCTURES (3).** Pr., all Basic Textile Courses. Methods of fabric forming other than conventional weaving or knitting are surveyed. More emphasis is placed on specific methods of greater economic significance.
323. **CARPET STRUCTURES (2).** Pr., all Basic Textile Courses. Methods of carpet formation are covered with emphasis on tufted structures.
342. **ANALYTICAL INSTRUMENTATION IN TEXTILES (3).** LEC. 2, LAB. 2. Pr., all Basic Textile Courses, TE 241. Use of specialized analytical instrumentation to assist in the production of textile products; as means to solve problems of color mixing, waste water characterization, dust measurement and the identification of materials. Systems control by instrumentation is also included.

ADVANCED UNDERGRADUATE TEXTILES

325. **DESIGN OF TEXTILE FABRICS (4).** LEC. 2, LAB. 4. Pr., all Intermediate Textile Courses. Technical fabric design drafts for woven and knit structures are studied. Patterns are developed on production machines. Problems of cost, material and people utilization as influenced by product design are presented.
330. **MECHANICS OF FLEXIBLE STRUCTURES (5).** Pr., TE 101, MH 265. Analysis of mechanical behavior and physical properties of one and two dimensional flexible structures; such as fibers, yarns, and fabrics. The influence of geometrical structure and material properties on the mechanical properties of flexible structures will be undertaken.
350. **TESTING OF TEXTILE MATERIALS (5).** LEC. 3, LAB. 4. Pr., all Intermediate Textile Courses. Basic principles of measuring the physical and chemical properties of natural and man-made textile materials; included supplementary laboratory experiments.
351. **ANALYSIS OF TEXTILE FABRIC STRUCTURES (5).** LEC. 3, LAB. 4. Pr., all Intermediate Textile Courses, TE 325. Analysis of textile fabrics, including woven, knit and non-conventional structures formed from the interlacings of primary materials. The student will make a technical, economic and manufacturing plan for the production of such materials.
352. **TEXTILE QUALITY CONTROL (3).** Pr., IE 220, TE 350. The practical application of quality control in the textile industry with emphasis on statistical control techniques. Areas covered include measures of variation, statistical quality control charts, sample size, confidence interval, significance testing, correlation, and analysis of variance.
380. **TEXTILE COSTING (3).** Pr., all Intermediate Textile Courses, TE 325, ACF 215. Application of accounting principles in the determination of product cost and profit analysis. The making of managerial decisions related to product mix, material utilization, and the allocation of resources to the manufacturing of textile products.
412. **SHORT STAPLE YARN MANUFACTURING (4).** LEC. 3, LAB. 2. Pr., TE 212. An applied course in the mechanics of converting short staple fibrous materials to yarns.
421. **JACQUARD WEAVING AND DESIGN (2).** LEC. 1, LAB. 2. Pr., all Intermediate Textile Courses. Jacquard mechanism and design of original patterns for jacquard loom.
422. **WARP KNIT STRUCTURES (3).** LEC. 2, LAB. 2. Pr., TE 321. Advanced study in design principles and mechanisms, production control, and yarn development in warp knit manufacturing.
425. **ASSEMBLY OF TEXTILE FABRIC STRUCTURES (3).** Pr., TE 351. An engineering approach to product development and the utilization of fabric composites in fabricated structures.
442. **TEXTILE INDUSTRY INTERNSHIP (2).** Pr., senior standing or Department Consent. Industry internship for one (1) quarter in a textile manufacturing plant or related business compatible with the individual student's curriculum.
470. **PLANT DESIGN, OPERATION & CONTROL — DYEING AND FINISHING (3).** Pr., TE 242. Principles of planning, operation and control of a textile dyeing and finishing plant. Includes technical requirements, use of resources, changing product mix, and emerging technology.
479. **HONORS THESIS (1-6).** Pr., COI and department head approval. Individual student endeavor consisting of directed research and writing of honors thesis. (Honors Program students only. May be repeated once for a maximum of 6 total credit hours.)

- 480-481. **PLANT DESIGN, OPERATION AND CONTROL I & II (3). LEC. 3, AND (3). LEC. 3.** Pr., TE 490 (for TE 480), TE 491, (TE 481). A two-quarter sequence in planning, operation and control in a textile manufacturing plant. Includes the problem of plant changeover, changing product mix, technical requirements, constraints, use of resources, plant location and design, changing markets and emerging technology.
482. **TEXTILE MANAGEMENT (3).** Pr., all Intermediate Textile Courses. A practical business management approach to the analysis and solution of problems in the textile industry. The major areas of concern to management are discussed, including policy determination, organization structure and analysis, employment function, manpower development, financing purchasing, production, merchandising, industrial and public relations.
483. **SEMINAR (2).** Pr., senior standing. Course content will vary from quarter to quarter to provide focus on current issues and special problems in the textile industry.
- 490-491. **UNDERGRADUATE RESEARCH I, II, (5), (5).** Pr., Inter. Textiles, TE 351, 352. A two quarter sequence in undergraduate research.

ADVANCED UNDERGRADUATE AND GRADUATE COURSES

523. **CARPET MANUFACTURING (5).** Pr., TE 323. Carpet structure formation in terms of manufacturing, product development, and plant operation.
530. **ADVANCED MECHANICS OF FLEXIBLE STRUCTURES (3).** Pr., TE 330 or COI. Advanced mechanical behavior of flexible structures, based on their geometrical parameters and properties of their constituent materials.
531. **STRUCTURES AND PROPERTIES OF FIBERS AND POLYMERS (5).** Pr., CH 208 or equivalent or CH 515. An accelerated course covering the uses, structures, and properties of fibers and polymers. The use of a fiber depends on its properties and these properties in turn depends on the chemical structure and morphology of the fiber. These interrelationships are explored.
532. **FIBERS LABORATORY (2).** LAB. 4. Coreq. TE 531. A Fibers Laboratory to accompany TE 531 will include microscopic and chemical techniques of fiber identification and chemical and physical methods useful in the preparation and analysis of fibers.
541. **APPLIED DYEING THEORY (5).** LEC. 5. Pr., TE 242. Dye film bonding; thermodynamics and kinetics of dyeing.
560. **TEXTILE FINISHES (4).** Pr., TE 242, or COI. Textile finishing processes, machinery, and developing technology are covered. Both mechanical and chemical finishing are included. Emphasis is on the theory of application, the mechanism by which the finish works, and its effect on fabric properties.

Theatre (TH)

Professor Harrison

Associate Professors Garren, Head, Miller

Assistant Professors Powel, Walker, Hiatt, and Dowker

100. **THEATRE CONVOCATION (0).** Required of all declared theatre majors during every quarter of residency. Workshops, critiques, performances, lectures, and discussions by faculty, students and visiting artists and scholars.
101. **INTRODUCTION TO THE THEATRE (3).** Appreciation of theatre arts including stage, television and film. Development of sensitivity and critical sophistication as articulate, discriminating theatregoers. Play and film viewing, play reading, critiques and term projects.
200. **INTRODUCTION TO ACTING AND DIRECTING (4).** Exploration of the basic principles and processes of acting and directing through lecture, discussion and concentrated laboratory work.
211. **ACTING: FUNDAMENTALS (4).** Pr., TH 200 or COI. Develops ability to respond to imaginative situations with sincerity, individuality and effectiveness; projects in elementary stage technique exercises to aid the student to develop awareness of his/her expressive mechanism and creative imagination through improvisation.
212. **ACTING: TECHNIQUES (4).** Pr., 211 or COI. Exploration of basic performance techniques utilizing improvisation and theatre games; emotional and sensory recall, and elementary script analysis through open scenes and written play texts.
214. **STAGE MOVEMENT (3).** Pr., TH 200 or COI. Theory and practice in training the body to serve as a means of communication for the actor.
215. **STAGE VOICE (3).** Theory and techniques of speaking voice production for the stage.
231. **THEATRE TECHNOLOGY I (4).** Principles and practice in the planning, drafting of work drawings, construction, painting, rigging, and shifting of stage scenery. Practical experience.
232. **THEATRE TECHNOLOGY II (4).** Principles and practice of stage lighting technology, stage sound technology and the construction of hand, set, and dress properties for the stage.
233. **DRAFTING FOR THE THEATRE (4).** Pr., 231 or COI. A comprehensive study of the techniques and methods used in the graphic representation of stage scenery and properties.
240. **THEATRICAL DESIGN (4).** The elements of design used in the creation of theatrical space. Exploration of the fundamental visual design elements and materials with experimentation in their application to theatrical design. Practical utilization of design theory in various visual and theatrical design projects.
261. **COSTUME CONSTRUCTION (4).** The basic steps used in costume construction for the theatre from patterns through final ornamentation. Practical experience.

265. **STAGE MAKEUP (3).** Basic principles and practice of stage makeup and makeup design including facial painting and techniques of prosthesis.
271. **PLAY ANALYSIS (4).** Pr., 101 or COI. How to read a play with an examination of traditional and non-traditional scripts of various periods and genres.
281. **THEATRE PRODUCTION I (4-6).** Pr., consent of the department; offered summers only. Intensive study of theatre arts through participation in the AU Summer Repertory Theatre.
282. **SUMMER REPERTORY THEATRE COMPANY (6-12).** Pr., consent of the department; offered summers only. A concentrated workshop experience in all aspects of theatre production through participation in rehearsal and performance.
300. **THEATRE LABORATORY (1-4).** Required of all theatre majors during every quarter of residency; a minimum of 9 hrs. required for graduation. Practice in various areas of arts and crafts of theatre, including construction and painting of scenery and properties, stage operation, lighting, sound, costuming, makeup, publicity, and business management.
302. **THEATRE APPRECIATION (1).** Attendance at selected local theatre and film productions with discussion sessions prior to and following performances. Brief critical papers required.
305. **CREATIVE DRAMATICS (3).** Leadership principles in creative dramatics; story materials and their adaptation to children's needs; techniques for planning, guiding, and evaluating improvised drama; emphasis on creative dramatics as a teaching/learning tool in the classroom.
306. **CHILDREN'S THEATRE (3).** Theatre for children, involving an examination of play scripts, acting, and production techniques.
310. **ACTING: PRACTICUM (1-4).** Open to students cast in Auburn University Theatre productions.
311. **ACTING: CHARACTERIZATION (4).** Pr., 212 or COI. Theory and technique of character analysis, development and the process of creating a role through the study of all characters in a significant modern play text.
312. **ACTING: SCENE STUDY (4).** Pr., 311 or COI. Advanced characterization study and application, including rehearsal and performance of roles from selected scenes before an invited audience.
320. **STAGE MANAGEMENT (3).** Pr., TH 231 or COI. Basic principles of stage management, involving the duties of the stage manager in relation to production and personnel.
321. **DIRECTING: FUNDAMENTALS (4).** Pr., 211, 271 or COI. Theories and techniques of stage direction; analysis of plays; preparation of production plans; practice in stage direction, including open casting and production of at least two scenes before an invited audience.
322. **DIRECTING: ADVANCED (4).** Pr., 321 or COI. Advanced theories and techniques of stage direction; problems of dealing with actors, characterization and style; production of selected scenes and/or one-act play before an invited audience.
331. **ADVANCED THEATRE TECHNOLOGY (4).** Pr., 231 or COI. Practical application of new materials and techniques in the theatre, including plastics, metals, and other non-traditional products.
332. **STAGE CARPENTRY TECHNIQUES (4).** Pr., 231 or COI. Methods and techniques employed in construction and rigging of stage scenery and properties, including both the traditional and non-traditional methods and solutions used in scenic construction.
333. **SCENE PAINTING (4).** Pr., 240 or COI. Practical techniques and skills for executing the scenic/visual elements of theatrical designs, including traditional painting styles and non-traditional materials and methods.
341. **SCENE DESIGN I (4).** Pr., 240 or COI. Theory and practice of designing and executing scenery for the stage. Emphasis on traditional styles and methods. Fundamentals of presenting the design idea in perspective rendering and model form.
342. **PROPERTY DESIGN (3).** LEC. 2, LAB. 2. Pr., TH 240 or COI. History, theory and practice of designing and executing properties for the stage, including furniture.
345. **RENDERING FOR THE THEATRICAL DESIGNER (4).** Pr., 240 or COI. Exploration of traditional drawing and rendering techniques to facilitate designer communication in scenic, lighting and costume design. Exercises in handling a variety of artistic media.
351. **LIGHTING DESIGN (4).** Pr., 232, 240 or COI. Principles and practice of stage lighting both as a design and technical medium. Practical production experience in lighting traditional and experimental theatre spaces.
361. **COSTUME HISTORY I (4).** The history of costume from ancient Egypt through 1750.
362. **COSTUME HISTORY II (4).** The history of costume from 1750 to the present.
363. **ADVANCED COSTUME CONSTRUCTION I (4).** Pr., 261 or COI. The study of pattern drafting and draping and their relationship to a costumer's craft.
365. **COSTUME DESIGN I (4).** Pr., 240, 361, 362 or COI. Principles and practice of costume design with emphasis on designing and rendering costumes from various historical periods.
371. **HISTORY OF THEATRE I (3).** Social, religious, political, and artistic forces that have contributed to the development of theatre and drama in western civilization from its origin through the Medieval theatre.
372. **HISTORY OF THEATRE II (3).** Social, religious, political, and artistic forces that have contributed to the development of theatre and drama in western civilization beginning with the Renaissance and continuing through French Neo-Classical.

373. **HISTORY OF THEATRE III (3).** Social, religious, political, and artistic forces that have contributed to the development of theatre and drama in western civilization beginning with English Restoration and continuing to 1875.
374. **HISTORY OF THEATRE IV (3).** Social, religious, political, and artistic forces that have contributed to the development of modern European theatre and drama from 1875 to 1980.
400. **PROFESSIONAL INTERNSHIP (1-12).** Pr., completion of core program in BFA theatre major and permission of the department. Internship with professional or community theatres in the student's general field of specialization (1 hr. credit for each 30 hrs work).
405. **THEATRE OPERATIONS/MANAGEMENT (4).** Theory and practice of theatre management and arts administration.
409. **THEATRE OPERATIONS/MANAGEMENT: SPECIAL PROJECTS (2-4).** Pr., COI. Selected projects in theatre management and arts administration.
411. **ACTING: CLASSIC PERIODS (4).** Pr., 312 or COI. Exploration of acting problems in the performance of dramatic works from various pre-modern theatrical periods, styles and genres; rehearsal and performance of roles from selected scenes before an invited audience.
413. **ACTING: AUDITIONS (4).** Pr., 312 and COI. The theories, techniques and realities of auditions: preparation of 5-10 pieces with presentation of at least 4-5 selected pieces before an invited audience.
419. **ACTING: SPECIAL PROJECTS (2-4).** Pr., COI; repeatable to a maximum of 8 hrs. Selected advanced projects or recitals for public theatre production.
421. **DIRECTING: PERIODS (4).** Pr., 322 or COI. Advanced theories and techniques of stage direction relating to problems of verse and period dramatic literature; production of selected scenes before an invited audience.
429. **DIRECTING: SPECIAL PROJECTS (2-4).** Pr., or COI; repeatable to a maximum of 8 hrs. Direction of a long one-act or full length play for public performance.
439. **THEATRE TECHNOLOGY: SPECIAL PROJECTS (2-4).** Pr., COI; repeatable to a maximum of 8 hrs. Selected projects in theatre technology and/or technical direction executed before a public audience.
441. **HISTORY OF DESIGN IN THE THEATRE (4).** A survey of design elements, including architecture, as practiced in the significant movements in theatre history from the time of the ancient Greeks to the present.
442. **SCENE DESIGN II (4).** LEC. 3, LAB. 3. Pr., 341 or COI. Advanced theory and practice in the use of scenery and light for the theatrical event. Emphasis on experimental and non-traditional design for a variety of theatre spaces.
449. **SCENE DESIGN: SPECIAL PROJECTS (2-4).** Pr., COI; repeatable to a maximum of 8 hrs. Selected projects in scenic design executed before a public audience.
459. **LIGHTING DESIGN: SPECIAL PROJECTS (2-4).** Pr., COI; repeatable to a maximum of 8 hrs. Selected projects in lighting design executed before a public audience.
461. **ADVANCED COSTUME CONSTRUCTION II (4).** Pr., 261 or COI. The principles and execution of tailoring period and modern clothes for the stage and the utilization of a costumer's related crafts chosen from macrame, knitting, fabric painting, basic millinery, jewelry construction and cobbling.
465. **COSTUME DESIGN II (4).** LEC. 3, LAB. 3. Pr., 365 or COI. Advanced principles and practice of costume design with emphasis on designing and rendering costumes utilizing new and/or non-traditional approaches.
469. **COSTUME DESIGN: SPECIAL PROJECTS (2-4).** Pr., COI; repeatable to a maximum of 8 hrs. Selected projects in costume and/or makeup design executed before a public audience.
471. **AMERICAN THEATRE HISTORY I (3).** A survey of American theatre and drama from the beginnings to World War I.
472. **AMERICAN THEATRE HISTORY II (3).** A survey of American theatre and drama from World War I to the present.
475. **DRAMATIC THEORY AND CRITICISM (4).** A survey and analysis of selected writings on the structure and aesthetic values of both the drama and the theatre.
481. **THEATRE PRODUCTION II (4-8).** Pr., 281 and consent of the department; offered summers only. Advanced problems solving in theatre production with emphasis upon individual assignment to positions in the repertory theatre.
482. **SUMMER REPERTORY THEATRE COMPANY II (6-12).** Pr., 282 and consent of the department; offered summers only. An intensive experience in all aspects of theatre production. The advanced student may focus on the development of professional artistic skills.
491. **INDEPENDENT STUDY (1-4).** Pr., COI and the department head. Repeatable to a maximum of 16 hrs. Directed reading and tutorial projects of interest to the advanced student.
498. **THEATRE SEMINAR: (various titles to be assigned) (1-5).** Pr., COI; repeatable to a maximum of 16 hrs. Intensive study of special theatre topics falling outside the regular theatre offerings. Individual topics announced prior to offering of the course.

Veterinary Medicine (VM)**ANATOMY AND HISTOLOGY**

Professors Holloway, *Head*, and Krista
 Associate Professors Buxton, Cartee, Gray, and Rumph
 Assistant Professors Garrett, Marshall, and Reynolds

MICROBIOLOGY

Professors Smith, *Head*, Attleberger, and Rossi
 Adjunct Professor Laureman
 Associate Professors Scanlan, Swango, and Wilt
 Adjunct Associate Professors Christenberry, Klesius, and Giambrone
 Assistant Professors Brunner, Nusbaum, Panangala, and D. Stringfellow
 Adjunct Instructor Brown and J. Stringfellow
 Research Associates Rowe, Pearce, and Glass

PATHOLOGY AND PARASITOLOGY

Professors Wolfe, *Head*, Bailey, Groth, Moore, Morgan,
 Mitchell, Powers, Robinson, and Spano
 Adjunct Professors Baker and Lindsey
 Associate Professors Kwapien and Teer
 Adjunct Associate Professors Bone, Ernst, and Frandsen
 Assistant Professors Blagburn, Boosinger, Hanrahan, and Hendrix
 Adjunct Assistant Professors Bottjer and Hoerr
 Instructors Newton, Oliver, and Sartin
 Adjunct Instructor D'Andrea
 Research Associates Buxton, Lindsay, and Tovio-Kinnucan
 Residents V. Walker and D. Walker

PHYSIOLOGY AND PHARMACOLOGY

Professors Clark, *Head*, Beckett and Robertson
 Associate Professors Branch and Pedersoli
 Assistant Professors Kempainen, Myers, and Sartin
 Instructor Owens, Hammond, and Norstrandt
 Research Associate Young

RADIOLOGY

Professor Bartels, *Head*
 Assistant Professors Brawner and Hathcock
 Instructor Windeler

LARGE ANIMAL SURGERY AND MEDICINE

Professors Walker, *Head*, Hudson, Purohit, Vaughan, and Wiggins
 Adjunct Professor Montes
 Associate Professors Hoover, Humburg, and Powe
 Adjunct Associate Professor Kjar
 Assistant Professors Carson, Duran, McClary, Putnam,
 Schumacher, Smith, Wolfe, Riddell, and Smyth
 Adjunct Assistant Professor Thompson
 Residents Juzwiak, Goodman, and Mysinger
 Intern Brusie

SMALL ANIMAL SURGERY AND MEDICINE

Professors Knecht, *Head*, Albert, Hanks, Horne, Redding, Swaim, and Braund
 Adjunct Professors Hughston and Silberman
 Associate Professors Dillon, Henderson, MacDonald, Milton, Pidgeon,
 Zenoble, and Simpson
 Assistant Professors Mansfield, Sorjonen, and Wiggins
 Residents Miller, Montgomery, Newman, Shores, and Brockus
 Interns Carothers, Case, and Freshman

VETERINARY MEDICINE (VM)

Following this section of Veterinary Medicine Course Descriptions, the remaining VM courses are listed under their alphabetically arranged departments.

300. **ORIENTATION** (2). Fall. Dynamics of professional responsibilities, duties and privileges of the veterinarian.
313. **PHYSIOLOGY I** (5). LEC. 5. Fall. Cell physiology, digestion and metabolism.
314. **PHYSIOLOGY II** (2). LEC. 2. Fall. Respiratory physiology.
315. **PHYSIOLOGY III** (5). LEC. 5. Winter. Endocrinology and reproductive physiology.
316. **PHYSIOLOGY IV** (4). LEC. 3, LAB. 2. Winter. Blood and electrocardiology.
318. **PHYSIOLOGY V** (4). LEC. 4. Spring. Cardiovascular and renal physiology.
- 318L. **PHYSIOLOGY LAB. III** (1). LAB. 2. Spring. Physiology and Pharmacology experiments on the cardiovascular system and the kidney.
319. **PHARMACOLOGY I** (2). LEC. 2. Pr., VM 318. Spring. Introductory pharmacology.
- 320-321-322. **ANATOMY I, II, III** (5-5-5). LEC. 2, LAB. 10. Fall, Winter, Spring. Gross anatomy of domestic animals. The gross structures of the dog, cat, ox, horse, hog, fowl, laboratory animals, and zoo animals.
326. **MICROSCOPIC ANATOMY I** (5). LEC. 2, LAB. 6. Fall. Microscopic anatomy of the form, structure, and characteristics of the basic tissues of animals.
327. **MICROSCOPIC ANATOMY II** (5). LEC. 2, LAB. 6. Pr., VM 326. Winter. Microscopic anatomy of the tissue, composition of organs and organ systems.
328. **MICROSCOPIC ANATOMY III** (4). LEC. 2, LAB. 4. Pr., VM 327. Spring. Microscopic anatomy of the reproductive organs. Formation and early development of the embryos of domestic animals. Fetal membranes and placenta-tion are emphasized.
331. **VETERINARY MICROBIOLOGY I** (4). LEC. 3, LAB. 2. Spring. Veterinary Immunology for students in Veterinary Medicine.
401. **PHARMACOLOGY II** (3). LEC. 2, LAB. 2. Pr., VM 319. Fall. Pharmacology of general anesthetics.
402. **PHARMACOLOGY III** (4). LEC. 3, LAB. 2. Pr., VM 401. Winter. Systematic pharmacology.
403. **PHYSIOLOGY VI** (4). LEC. 3, LAB. 2. Pr., VM 318-319. Fall. Neurology, radiobiology and the pharmacodynamics of drugs affecting the central nervous system.
404. **PHYSIOLOGY VII** (3). LEC. 2, LAB. 2. Pr., VM 403. Winter. Neurology, and the pharmacodynamics of drugs affecting the central nervous system and radiobiology.
405. **PATHOLOGY** (5). LEC. 4, LAB. 2. Pr., VM 322, 328. Fall. General concepts of pathology, introduction to disease processes affecting animals, laboratory work on gross and microscopic pathological changes.
406. **PATHOLOGY II** (5). LEC. 4, LAB. 2. Pr., VM 405. Winter. Continuation of VM 405.
407. **PATHOLOGY III** (4). LEC. 3, LAB. 2. Pr., VM 406. Spring. Continuation of VM 406.
408. **LABORATORY ANIMAL MEDICINE** (3). LEC. 2, LAB. 2. Pr., VM 405 and 406. Spring. Management, utilization, and disease of the common laboratory mammals including rats, mice, guinea pigs, hamsters, rabbits, and nonhuman primates.
409. **VETERINARY PARASITOLOGY I** (4). LEC. 3, LAB. 2. Fall. Introduction to parasitology including internal and external parasites of domestic animals.
410. **VETERINARY PARASITOLOGY II** (5). LEC. 4, LAB. 2. Pr., VM 409. Winter. Continuation of VM 409.
411. **VETERINARY MICROBIOLOGY II** (4). LEC. 2, LAB. 4. Pr., VM 331. Fall. Bacteriology and Mycology of Veterinary Pathogens.
412. **VETERINARY MICROBIOLOGY III** (5). LEC. 3, LAB. 4. Pr., VM 331 and 411. Winter. Veterinary Virology. Rickett-siology and chlamydia are considered briefly.
413. **PREVENTIVE MEDICINE** (4). LEC. 4. Spring. Principles of epidemiology, preventive medicine, and environmen-tal health, selected diseases of animals transmissible to men and the relationship of the veterinarian to public health and animal disease control agencies.
414. **VETERINARY MEDICINE I** (5). LEC. 5. Spring. Detailed etiology, symptoms, pathogenesis, diagnosis, treatment, and prevention of the medical diseases affecting the various systems and organs of the equine, bovine, ovine and porcine species.
420. **VETERINARY MEDICINE II** (5). LEC. 5. Fall. Continuation of VM 414 and includes nutritional deficiency diseases.
421. **VETERINARY SURGERY I** (3). LEC. 3. Fall. Background of surgery; major surgical injuries — wounds, fluid loss and infection; preoperative and postoperative care; surgical techniques; anesthesia.
422. **VETERINARY SURGERY II** (3). LEC. 3. Winter. Special surgical diseases of the domestic farm animals including surgery of the alimentary canal, the chest and abdomen, the respiratory and cardiovascular systems, the eye and ear, the genito-urinary tract, and the feet and limbs.

423. **CLINICAL PATHOLOGY (5).** LEC. 5. Pr., VM 407. Spring. Methods for the collection, preservation and examination of various body fluids including blood and urine. Interpretation of results is directed toward clinical diagnosis and prognosis.
424. **VETERINARY MEDICINE & SURGERY I (6).** Fall. The diagnostics, medical and surgical treatment of small animals.
425. **VETERINARY MEDICINE & SURGERY II (5).** Pr., VM 424. Winter. Continuation of VM 424.
427. **VETERINARY MEDICINE & SURGERY III (3).** LEC. 3. Pr., VM 424-425. Fall. The systemic diseases and clinical immunologic procedures in small domestic animals.
428. **PHYSICAL DIAGNOSIS (LAC) (2).** LEC. 1, LAB. 2. Fall. Demonstration and application of principles and techniques of physical diagnosis of large animals.
429. **PHYSICAL DIAGNOSIS (SAC) (1).** LAB. 2. Winter. Demonstration and practice of handling, restraint, physical diagnosis, and administration of therapeutic agents related to small animals.
430. **VETERINARY JURISPRUDENCE AND ETHICS (2).** Winter. Laws relating to the veterinary profession. Professional ethics for the veterinarian.
431. **VETERINARY RADIOLOGY (4).** LEC. 4. Fall. Basic diagnostic radiology including interpretations, techniques, therapy and equipment.
432. **VETERINARY MYCOLOGY (2).** LEC. 1, LAB. 2. Pr., VM 411. Winter. Mycology of veterinary pathogens.
434. **APPLIED ANATOMY (2).** LAB. 4. Spring. Anatomy related to diagnostic, obstetrical and surgical procedures.
435. **THERIOGENOLOGY (5).** LEC. 5. Spring. Clinical application of the physiology of reproduction, causes and correction of dystocia, genital examinations, and infertility of the male and female.
436. **SPECIAL ANATOMY (1-5).** (HOURS AND CREDIT TO BE ARRANGED.) Pr., VM 320. Elective course in which any phase of anatomy of domestic animals to the anticipated field on specialization may be studied.
437. **VETERINARY MEDICINE III (5).** Summer. Identification and study of selected poisonous plants of the U.S. and common chemical and venom poisoning of farm animals and pets. To include characteristic signs, lesions, methods of diagnosis, and treatment.
- 438-439. **VETERINARY MEDICINE IV, V (4-5).** Winter, Fall. Principal infectious diseases of large domestic animals. Epizootiology, etiology, clinical signs, diagnosis and diseases control including immunization and sanitation.
- 440-441-442-443. **CLINICS VII, VIII, IX, X (6-6-6-6).** Spring, Summer, Fall, Winter. Conferences, laboratory exercises, and practice in diagnosis, control, and therapy of diseases of small animals.
- 444-445-446-447. **CLINICS AND LARGE ANIMAL SURGERY AND THERIOGENOLOGICAL EXERCISES II, III, IV, V (7-7-7-7).** LAB. (12-18-17-18). Spring, Summer, Fall, Winter. Conferences, laboratory exercises, and practice in diagnosis, control, and therapy of diseases and surgical procedures for large domestic animals.
448. **VETERINARY SURGERY III (2).** LAB. 4. Fall. Introductory and detailed consideration and performance of small animal surgery.
449. **VETERINARY SURGERY IV (2).** LAB. 4. Pr., VM 428 & 448. Winter. Detailed consideration and performance of small animal surgery (continued).
451. **VETERINARY PUBLIC HEALTH II (2).** LEC. 2. Pr., VM 411. Winter. Principles and methodology of food hygiene including meat, milk, poultry, and other foods related to animal and human health.
452. **VETERINARY PUBLIC HEALTH III (2).** LEC. 2. Pr., VM 451. Winter. A continuation of VM 451.
453. **SEMINAR (2).** Each quarter. Literature reviews or research problems selected by the student. Papers written and oral presentation given before his class and faculty.
454. **PRECEPTORSHIP (0).** **NON-CREDIT REQUIRED COURSE.** Spring. Completion of satisfactory preceptorship during the spring quarter is required for graduation.

ANATOMY AND HISTOLOGY (VAH)

ADVANCED UNDERGRADUATE AND GRADUATE

- 520-521-522. **ANATOMY I, II, III (5-5-5).** LEC. 2, LAB. 10. Pr., COI. Fall, Winter, Spring. Gross anatomy of domestic animals. A comparative study of the gross structures of the dog, cat, horse, hog, fowl, laboratory animals and zoo animals.
526. **MICROSCOPIC ANATOMY I (5).** LEC. 2, LAB. 6. Pr., COI. Fall. Microscopic anatomy of the form, structure, and characteristics of the basic tissues of animals.
527. **MICROSCOPIC ANATOMY II (5).** LEC. 2, LAB. 6. Pr., COI. Winter. Microscopic anatomy of the tissue composition of organs and organ systems.
528. **MICROSCOPIC ANATOMY III (4).** LEC. 2, LAB. 4. Pr., COI. Spring. Microscopic anatomy of the reproductive organs. Formation and early development of the embryos of domestic animals. Fetal membranes and placenta are emphasized.
570. **HISTOLOGICAL TECHNIQUES (2-5).** Pr., COI. Quarter by arrangement. Detailed techniques employed in the preparation of cytological histological materials.

GRADUATE

621. **CARDIOVASCULAR ANATOMY (5).** LEC. 2, LAB. 9. Pr., COI. Quarter by arrangement. Structure of the cardiovascular system. Comparative developmental, and gerontologic phases emphasized.
622. **A COMPARATIVE STUDY OF THE UROGENITAL SYSTEM IN ANIMALS (5).** LEC. 2, LAB. 9. Pr. COI. Quarter by arrangement. Structure of the urinary and genital systems.
623. **NEUROANATOMY (5).** LEC. 2, LAB. 9. Pr., COI. Quarter by arrangement. Structure of the central and peripheral nervous systems.
624. **EXPERIMENTAL NEUROANATOMY (5).** LEC. 2, LAB. 9. Pr., COI. Quarter by arrangement. Use of the Horsley-Clark stereotaxic instrument and other experimental neuroanatomical procedures.
625. **ANATOMY OF THE LOCOMOTOR SYSTEM (5).** LEC. 2, LAB. 9. Pr., COI. Quarter by arrangement. Dissection of the structures of the locomotor system. The horse is utilized as the primary model.
626. **ANATOMY OF THE SPECIAL SENSES (5).** LEC. 2, LAB. 9. Pr., COI. Quarter by arrangement. Taste, smell, sight, and hearing. Macroscopic and microscopic specimens are utilized to correlate structure and function.
627. **ADVANCED HISTOLOGY OF DOMESTIC ANIMALS (5).** LEC. 2, LAB. 6. Pr., COI. Quarter by arrangement. The basic tissues. The light microscope and electron micrographs are utilized to interpret morphology.
628. **ADVANCED ORGANOLOGY OF DOMESTIC ANIMALS (5).** LEC. 2, LAB. 6. Pr., COI. Quarter by arrangement. Organs and organ systems, utilizing the light microscope and electron micrographs to interpret morphology.
696. **SEMINAR (1). QUARTER BY ARRANGEMENT.** Required of all graduate students who major in Veterinary Anatomy and Histology.
698. **RESEARCH PROBLEMS (2-5). (QUARTER AND CREDIT BY ARRANGEMENT.)**
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

LARGE ANIMAL SURGERY AND MEDICINE (VLA)

GRADUATE

- 851-852-853. **ADVANCED LARGE ANIMAL SURGERY (5-5-5).** LEC. 1, LAB. 8. Any quarter by arrangement. Research in surgery. Advanced techniques for surgical procedures in the domestic animals.
- 854-855. **ADVANCED LARGE ANIMAL MEDICINE (5-5).** LEC. 1, LAB. 8. Any quarter by arrangement. The causes, methods of diagnosis, treatment and methods of control and education of selected non-surgical diseases of domestic animals.
857. **GYNECOLOGY OF LARGE DOMESTIC ANIMALS (5).** Any quarter by appointment. Functional and infectious conditions affecting female reproduction.
858. **ANDROLOGY OF LARGE DOMESTIC ANIMALS (5).** Any quarter by arrangement. Functional and infectious conditions affecting breeding sires.
859. **ADVANCED VETERINARY ANESTHESIOLOGY (5).** LEC. 3, LAB. 4. Pr., COI and Graduate Standing. Summer. Advanced anesthetic principles and uses of various anesthetic agents in veterinary medicine with emphasis on clinical monitoring of physiological parameters and intensive care of clinical patients.
860. **HEALTH MAINTENANCE OF FOOD ANIMALS (5).** LEC. 5. Pr., graduate standing and COI. Any quarter by arrangement. Advanced principles of health maintenance of food and fiber animals emphasizing sustenance of the health state rather than the employment of restorative or preventive medicine.
861. **RECONSTRUCTIVE SURGERY (5).** LEC. 2, LAB. 6. Fall, Even years. Techniques in reconstructive surgery in small and large animals.
898. **SEMINAR (1). REQUIRED OF ALL GRADUATE STUDENTS IN LARGE ANIMAL SURGERY AND MEDICINE.** Meets at scheduled intervals each year.
898. **RESEARCH PROBLEMS (2-5). (CREDIT TO BE ARRANGED.)**
899. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

MICROBIOLOGY (VMI)

GRADUATE

501. **VETERINARY BACTERIOLOGY (4).** LEC. 2, LAB. 4. Fall. Pr., COI and junior standing. Bacteriology of veterinary pathogens. Lecture same as VM 411.
502. **VETERINARY MICROBIOLOGY III (5).** LEC. 3, LAB. 4. Winter. Pr., COI and junior standing. Lecture same as VM 412. Animal viruses and associated diseases, pathogenesis of viral oncology, and host responses to viral infections and tumors. Chlamydia and rickettsia are considered briefly.
503. **PREVENTIVE MEDICINE (4).** LEC. 4, LAB. 0. Spring. Pr., COI and junior standing. Lecture same as VM 413. Principles of epidemiology, preventive medicine and environmental health. Selected diseases of animals transmissible to man and the relationship of veterinarians to public health and animal disease control agencies.

504. **VETERINARY MYCOLOGY (2).** LEC. 1, LAB. 2. Winter. Pr., COI, junior standing. Mycology of veterinary pathogens. Lecture same as VM 432.
536. **TISSUE CULTURE TECHNIQUES AND APPLIED VIROLOGY (3).** LEC. 1, LAB. 6. Fall. Pr., Departmental approval and junior standing. Fundamentals of mammalian tissue and cell culture with respect to the importance of water quality, media and buffers, glassware, plasticware; procedures of washing and sterilizing labware and equipment; techniques of primary tissue culture and the culture of continuous cell lines; and methods for the study of viruses in cell cultures.
540. **TOPICS IN ANAEROBIC BACTERIOLOGY (3).** LEC. 2, LAB. 2. Pr., COI. Quarter by arrangement. Current concepts in medical anaerobic bacteriology and diagnostic techniques to isolate and identify anaerobic bacteria.
601. **DETERMINATIVE VETERINARY BACTERIOLOGY (5).** LEC. 3, LAB. 4. Quarter by arrangement. Identification, classification, nomenclature, distribution and systematic relationship of bacteria of veterinary significance.
602. **BACTERIAL PATHOGENESIS (5).** LEC. 5. Quarter by arrangement. Pr., COI. How bacteria cause disease. The cellular and subcellular basis for bacterial pathogenesis. Study of bacterial toxins, host bacteria interaction, mixed bacterial and bacterial-viral infections.
604. **IMMUNOBIOLOGY (5).** LEC. 5. Quarter by arrangement. Pr., basic immunology and COI. The biologic basis of the immune response. Immunocompetent cells. Various types of immune responses. Histocompatibility and immunogenetics.
605. **IMMUNOLOGY OF INFECTIOUS DISEASES (5).** LEC. 5. Quarter by arrangement. Pr., COI. The immune mechanism of selected models of human and animal infectious diseases.
606. **BOVINE VIROLOGY (5).** LEC. 3, LAB. 4. Quarter by arrangement. PR., COI. Bovine viruses and the diseases they produce. Laboratory work includes techniques of studying bovine viruses and evaluating the resistance of the bovine to viral diseases.
607. **PATHOGENESIS OF VIRUS DISEASES OF ANIMALS (5).** LEC. 5. Spring. Pr., COI. How animal viruses produce disease in their hosts. Various well-studied models are used to demonstrate current theories and knowledge of pathogenetic mechanisms of virus-induced neurological diseases, enteric diseases, respiratory diseases, immune-complex diseases, and neoplastic diseases.
608. **ADVANCED EPIDEMIOLOGY (5).** LEC. 4, LAB. 2. Any quarter by arrangement. Pr., COI. Advanced techniques in epidemiological investigation; their application to diseases of man and animals for control purpose.
609. **MEDICAL MYCOLOGY (5).** LEC. 3, LAB. 4. Quarter by arrangement. Pr., COI and acceptable courses in bacteriology. Methods and techniques used in isolating and propagating yeasts, molds, and actinomycetes pathogenic for animals. Laboratory diagnosis of fungus infections in animals.
610. **IMMUNOBIOLOGY II (5).** LEC. 5. Quarter by arrangement. Pr., VMI 604. Modern theories of advanced medical immunology.
611. **COMMUNICATION OF EXPERIMENTAL WORK IN BIOMEDICAL SCIENCES (1).** LEC. 1. Winter. Pr., COI. An introduction to methods of information retrieval and storage; the evaluation of scientific reports; the organization and preparation of data for the oral and written reports.
612. **METHODS OF IMMUNOLOGY (3-5).** LEC. 1, LAB. 8. Fall, even years. Pr., COI. Advanced technology in the areas of immunobiology, immunochemistry, and immunopathology are offered. The course requires the formulation of a hypothesis, a literature search, utilization of at least 3 different immunologic techniques to solve the problem, and writing a paper, in journal style, to report the results of the problem solving exercises.
613. **CLINICAL IMMUNOLOGY (3).** LEC. 3. Spring, even years. Pr., COI. Basic Immunology. Histology and/or Introductory Pathology. The course will present current concepts in clinical immunology and immunopathology. Emphasis is placed on the diseases mediated by the immune response and the techniques required to diagnose immunologic disorders. The course is taught on a systems basis and is designed for individuals with a clinical background or interest.
614. **DIAGNOSTIC TECHNIQUES IN VETERINARY MICROBIOLOGY (5).** LEC. 1, LAB. 4. Pr., COI. Quarter by arrangement. Acquaint advanced microbiology students with techniques used in the modern microbiological diagnostic lab.
615. **IMMUNOBIOLOGY (3-5).** Pr., VMI 604. Quarter by arrangement. Provides an analysis and examination of the current literature in immunobiology.
696. **SEMINAR (1).** Quarter by arrangement. Required of all graduate students who major in Veterinary Microbiology.
698. **RESEARCH PROBLEMS (2-5).** (QUARTER AND CREDIT BY ARRANGEMENT.)
699. **RESEARCH AND THESIS.** (QUARTER AND CREDIT BY ARRANGEMENT.)
799. **RESEARCH AND DISSERTATION.** (QUARTER AND CREDIT BY ARRANGEMENT.)

PATHOLOGY AND PARASITOLOGY (VPP) ADVANCED UNDERGRADUATE AND GRADUATE

518. **GENERAL PATHOLOGY (5).** LEC. 4, LAB. 2. Pr., satisfactory courses in histology and physiology. COI. Fall quarter, first eight weeks. The fundamental alterations of disease, for especially qualified graduate students.
567. **GROSS PATHOLOGY* (2).** LAB. 6. Pr., VM 405 or VPP 518, and COI. Any quarter by arrangement. Regular participation in the necropsy examinations under the supervision of senior staff members. Gives the graduate student experience in necropsy procedures and in diagnostic-interpretation of gross lesions.

575. **SPECIAL TECHNIQUES IN HISTOPATHOLOGY*** (3). LEC. 1, LAB. 4. Pr., COI. Any quarter by arrangement. Special stains and techniques of histochemistry employed in the preparation of materials for histopathologic study.

GRADUATE

601. **PATHOLOGY** (2-5). LEC. 2, LAB. 9. Pr., D.V.M. degree or equivalent, COI. Any quarter by arrangement. May be taken more than 1 quarter for a maximum of 10 credits in M.S. program or 20 credits in Ph.D. program. Mechanisms of response in domestic animals to diseases, the description and recognition of lesions, and other topics to meet the particular needs of students.
605. **DIAGNOSTIC PATHOLOGY*** (2-5). Any quarter by arrangement. Limited to graduate students and residents in pathology. The diagnosis of animal diseases using necropsy procedures and histopathologic examination of tissue sections. Work will be under the supervision of a senior pathologist.
606. **SURGICAL PATHOLOGY*** (1-3). Any quarter by arrangement. Limited to graduate students and residents in pathology. The histopathologic diagnosis of surgical biopsy specimens. Work will be under the supervision of a senior pathologist.
614. **DIAGNOSTIC ONCOLOGY*** (5). LEC. 1, LAB. 8. Pr., COI. Any quarter by arrangement. Gross and microscopic pathology of neoplasms of domestic animals.
620. **MECHANISMS OF TOXICOLOGIC DISEASE** (5). LEC. 4, LAB. 2. Pr., Basic knowledge of mammalian physiology and biochemistry, COI. Spring. Pathophysiology involved in the development of animal diseases associated with environmental and naturally occurring toxicants, morphologic implications, opportunity to select clinical, pathological, or analytical aspects of toxicology for laboratory assignments.
630. **ANIMAL MODELS FOR BIOMEDICAL RESEARCH** (5). LEC. 2, LAB. 6. Pr., D.V.M. degree or equivalent and COI. Any quarter by arrangement. Principles of disease processes in domestic and laboratory animals for use as experimental models in biomedical research.
649. **SLIDE SEMINAR*** (1). All quarters. Limited to graduate students and residents in pathology. Weekly slide conference to discuss current diagnostic material. Required participation by all graduate students and residents in pathology.
650. **ADVANCED CLINICAL PATHOLOGY I*** (5). LEC. 5. Pr., VM 423 or equivalent. Fall. A comprehensive evaluation of diseases altering the lymphohematopoietic system.
651. **ADVANCED CLINICAL PATHOLOGY II*** (5). LEC. 5. Pr. VM 423 or equivalent. Winter. The concepts relating modern laboratory investigations to disease pattern recognition.
654. **CLINICAL ONCOLOGY*** (5). LEC. 5. Concepts useful in the diagnosis and treatment of neoplastic diseases.
670. **VETERINARY PROTOZOOLOGY AND ENTOMOLOGY** (5). LEC. 3, LAB. 4. Pr., VM 410 or ZY 511, COI. Spring. Pathogenesis, diagnosis, therapy, and other topics relating to selected diseases of veterinary importance caused by protozoan and arthropod parasites.
674. **VETERINARY HELMINTHOLOGY** (5). LEC. 3, LAB. 4. Pr., VM 410 or ZY 511 or equivalent, COI. Summer. Pathogenesis, diagnosis, therapy, and other topics relating to selected diseases of veterinary importance caused by helminth parasites.
678. **PATHOLOGY OF PARASITIC DISEASES** (5). LEC. 2, LAB. 6. Pr., VPP 518, COI. Any quarter by arrangement. Gross and microscopic pathology of parasitic diseases of veterinary importance.
696. **SEMINAR** (1). Required of all graduate students with a major in veterinary Pathology and Parasitology. Any quarter by arrangement.
698. **RESEARCH PROBLEMS** (2-5). (CREDIT TO BE ARRANGED.)
699. **RESEARCH AND THESIS.** (CREDIT TO BE ARRANGED.)
799. **RESEARCH AND DISSERTATION.** (CREDIT TO BE ARRANGED.)

PHYSIOLOGY AND PHARMACOLOGY (VPH) ADVANCED UNDERGRADUATE AND GRADUATE

513. **PHYSIOLOGY I** (4). LEC. 4. Fall. Cell physiology, digestion and metabolism.
514. **PHYSIOLOGY II** (2). LEC. 2. Fall. Respiratory physiology.
515. **PHYSIOLOGY III** (5). LEC. 5. Winter. Endocrinology and reproductive physiology.
516. **PHYSIOLOGY IV** (4). LEC. 3, LAB. 2. Winter. Blood and electrocardiology.
518. **PHYSIOLOGY VI** (4). LEC. 4. Spring. Cardiovascular and renal physiology.
519. **PHARMACOLOGY I** (2). LEC. 2. Pr., VM 318. Spring. Introductory pharmacology.
521. **PHARMACOLOGY II** (2). LEC. 2, LAB. 2. Pr., VM 319. Fall. Pharmacology of general anesthetics.
522. **PHARMACOLOGY III** (4). LEC. 3, LAB. 2. Pr., VM 401. Winter. Systematic pharmacology.
523. **PHYSIOLOGY VII** (4). LEC. 3, LAB. 2. Pr., VM 318-319. Fall. Neurology, radiobiology and the pharmacodynamics of drugs affecting the central nervous system.
524. **PHYSIOLOGY VIII** (3). LEC. 2, LAB. 2. Pr., VM 403. Winter. Neurology, and the pharmacodynamics of drugs affecting the central nervous system and radiobiology.

GRADUATE

601. **MEDICAL PHYSIOLOGY I** (5). LEC. 4, LAB. 2. Pr., an acceptable course in physiology. Fall & Spring. Functional analysis of mammalian organ systems with special emphasis on myology, neurology, circulation and respiration. Laboratory exercises will make use of the physiograph to validate physiologic functions.
602. **MEDICAL PHYSIOLOGY II** (5). LEC. 4, LAB. 2. Pr., an acceptable course in physiology. Winter & Spring. A continuation of VPH 601 with special emphasis on digestive, excretory, endocrine and reproductive systems.
605. **RESPIRATORY PHYSIOLOGY** (5). Pr., PH 601. Summer. Respiratory physiology and the physiological aspects of aviation, space and deep sea diving.
610. **EXPERIMENTAL PHYSIOLOGICAL TECHNIQUES** (5). LEC. 3, LAB. 6. Pr., COI. Spring. Anesthetic and surgical techniques used in many research procedures. Not for veterinary students.
631. **ADVANCED RENAL AND HEPATIC PHYSIOLOGY** (5). LEC. 4, LAB. 3. Pr., VPH 602. Summer. The physiology of the liver and kidney and the effects that certain disease processes have on these organs.
632. **ADVANCED ENDOCRINOLOGY AND REPRODUCTION** (5). LEC. 4, LAB. 3. Pr., VPH 602. Fall. The endocrine and reproductive systems of domestic animals in both health and disease.
633. **ADVANCED NEUROLOGY** (5). LEC. 4, LAB. 3. Pr., VPH 601. Winter. The physiology of the mammalian nervous system. Considerable emphasis will be placed on the physiological explanation of abnormalities and the use of the electroencephalogram.
635. **VETERINARY PHARMACOLOGY I** (5). LEC. 4, LAB. 2. Pr., acceptable course in physiology or pharmacology. Spring. Principles and mechanisms of drug action; passage of drugs across biologic barriers; mechanisms of absorption, distribution, biotransformation, and their effects on neurohumoral transmission. Drugs affecting the autonomic nervous system and muscle relaxants will be discussed.
636. **VETERINARY PHARMACOLOGY II** (5). LEC. 4, LAB. 2. Pr., acceptable course in physiology or pharmacology. Fall. Drugs of veterinary interest acting on the central nervous system. Basic principles of general anesthesia, general anesthetic agents, neuroleptanalgesics, dissociative anesthesia, narcotics and tranquilizers.
637. **VETERINARY PHARMACOLOGY III** (5). LEC. 4, LAB. 2. Pr., acceptable course in physiology or pharmacology. Winter. Drugs of veterinary interest that are used on the cardiovascular, digestive, reproductive and urinary systems will be discussed. Antibacterial drugs, antiseptics, insecticides and anthelmintics will also be included.
638. **PHYSIOLOGY OF DIGESTION** (5). LEC. 5. Pr., VPH 602. Spring. Enzymatic and bacterial digestion as well as the motility of the gastrointestinal tract in farm animals.
639. **SMALL ANIMAL NUTRITION** (5). LEC. 4, LAB. 3. Any quarter by arrangement. Pr., COI and acceptable courses in physiology. Requirement of amino acids, fats, carbohydrates, minerals and vitamins for dogs, cats and other small animals. Nutritional antagonists and symptoms of nutritional deficiencies in the animals.
645. **CARDIOLOGY** (5). Pr., VPH 601. Fall. The physiology of the heart and advanced techniques used in electrocardiology.
696. **SEMINAR** (1). Required of all graduate students in this department.
698. **RESEARCH PROBLEMS** (2-5). (CREDIT TO BE ARRANGED.)
699. **RESEARCH AND THESIS**. (CREDIT TO BE ARRANGED.)
799. **DOCTORAL RESEARCH AND DISSERTATION**. (CREDIT TO BE ARRANGED.)

RADIOLOGY (VR)
GRADUATE

580. **RADIOLOGICAL TECHNIQUES** (5). LEC. 3, LAB. 4. Any quarter by arrangement. A detailed study of radiographic techniques including assignments on basic radiation physics.
667. **NORMAL RADIOLOGICAL ANATOMY** (5). LEC. 4, LAB. 2. Any quarter by arrangement. A detailed study of the normal structure, size and position of the various organs as they appear on flat and contrast radiographs.
668. **ADVANCED RADIOLOGY*** (5). LEC. 1, LAB. 8. Any quarter by arrangement. A detailed study of advanced radiographic techniques including fluoroscopy, uses of contrast mediums and the principles of image intensification and cineradiography.
669. **RADIOLOGICAL INTERPRETATIONS*** (5). LEC. 1, LAB. 8. Any quarter by arrangement.
696. **SEMINAR** (1). Required of all graduate students in Veterinary Medicine. Meets by arrangement during final quarter in Graduate School.
698. **RESEARCH PROBLEMS** (2-5). (CREDIT TO BE ARRANGED.)
699. **RESEARCH AND THESIS**. (CREDIT TO BE ARRANGED.)
799. **RESEARCH AND DISSERTATION**. (CREDIT TO BE ARRANGED.)

SMALL ANIMAL SURGERY AND MEDICINE (VSA) ADVANCED UNDERGRADUATE AND GRADUATE

Candidates for a master's degree in the School of Veterinary Medicine may be required to pass a preliminary oral or written examination to demonstrate adequate knowledge in their chosen fields. They must meet the general requirements for admission into the Graduate School.

- 647. **CANINE NEUROSURGERY (5). LEC. 2, LAB. 6.** Fall. By arrangement. The applied anatomy, physiology, physical and radiographic diagnosis, and surgical correction of lesions (especially those of traumatic origin) affecting the nervous system of the dog.
- 659. **ADVANCED VETERINARY ANESTHESIOLOGY (5). LEC. 3, LAB. 6.** Summer by arrangement. Advanced anesthetic principles and uses of various anesthetic agents in veterinary medicine with emphasis on clinical monitoring of physiological parameters and intensive care of critical patients.
- 660. **ADVANCED SMALL ANIMAL SURGERY (5). LEC. 3, LAB. 6.** Spring by arrangement. Techniques in general small animal surgery.
- 661. **RECONSTRUCTIVE SURGERY (5). LEC. 2, LAB. 6.** Fall by arrangement. Techniques in reconstructive surgery in small and large animals.
- 662. **ADVANCED SMALL ANIMAL ORTHOPEDIC SURGERY (5). LEC. 3, LAB. 6.** Spring by arrangement. New techniques in general orthopedic surgery.
- 663. **ADVANCED VETERINARY OPHTHALMOLOGY I. GENERAL OPHTHALMOLOGY (5). LEC. 3, LAB. 4.** By arrangement. Advanced general techniques of diagnosis, medication and surgical techniques necessary for veterinary ophthalmology.
- 664-665. **ADVANCED SMALL ANIMAL MEDICINE (5-5). LEC. 5.** By arrangement. The causes, methods of diagnosis, treatment and control of non-surgical diseases of small animals.
- 666. **ADVANCED CANINE NEUROLOGY (5). LEC. 3, LAB. 6.** By arrangement. The neurodiagnostics and non-surgical therapy of neurological disorder in small domestic animals.
- 671. **SMALL ANIMAL CARDIOVASCULAR SURGERY (5). LEC. 3, LAB. 6.** By arrangement. Application of accepted, as well as the recently developed techniques of cardiovascular surgery.
- 672. **ADVANCED VETERINARY OPHTHALMOLOGY II. INSTRUMENTATION (5). LEC. 2, LAB. 6.** By arrangement. Emphasis is placed on the use of advanced instrumentation necessary for the diagnosis and treatment of ocular disease.
- 673. **ADVANCED VETERINARY OPHTHALMOLOGY III. ADVANCED OPHTHALMIC MEDICINE (5). LEC. 5, Pr., VSA 672.** By arrangement. Ophthalmology with emphasis on diagnosis and treatment of ocular diseases.
- 674. **ADVANCED VETERINARY OPHTHALMOLOGY IV. ADVANCED OPHTHALMIC SURGICAL TECHNIQUE (5). LEC. 2, LAB. 6, Pr., VSA 673.** Quarter by arrangement. Ophthalmology with emphasis on ophthalmic surgery.
- 696. **SEMINAR (1).** Required of all graduate students in Veterinary Medicine. Meets regularly at scheduled intervals each year during Summer Quarter.
- 698. **RESEARCH PROBLEMS (2-5). (CREDIT TO BE ARRANGED.)**
- 699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
- 799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Vocational and Adult Education (VED)

Professor Baker, *Head*

Associate Professors Drake, Frank, Hayes, Morgan, Selmon, and Wilson
Assistant Professors Andrews, Bond, Brown, Burgess, Halverson, Hartzog,
Patterson, Street, Trussell, Walters, White, and Williams

- 100. **KEYBOARDING FOR INFORMATION PROCESSING (2). LAB. 4. S/U.** Basic instruction on standard keyboards for data entry into computers.
- 102. **ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfers from other curricula and students pursuing the dual objectives program to understand teacher education and teaching as a profession.
- 104. **ORIENTATION TO LABORATORY EXPERIENCES IN AREA OF SPECIALIZATION (1).**
- 200. **TYPEWRITING I (3). LAB. 5.** Mastery of keyboard; techniques of machine operation; basic typewritten applications. For students with no previous training in typewriting. (Students with previous typewriting instruction not eligible for credit. Consult with VOA staff for placement.)
- 201. **TYPEWRITING II* (3). LAB. 5. Pr., VED 200** or one year of high school typewriting. Emphasis on business letters, tabulation, reports.
- 202. **TYPEWRITING III* (3). LAB. 5. Pr., VED 201.** Advanced typewritten communications with special problems and arrangement.

203. **TYPEWRITING IV* (3).** LAB. 5. Statistical typewriting; composition at the typewriter; executive office projects.
205. **TRANSCRIPTION FUNDAMENTALS (1).** LAB. 2. Pr., VED 200 or COI.
216. **PLASTICS TECHNOLOGY (2).** LEC. 1, LAB. 2. Laboratory oriented course in material and processes of plastic products.
246. **INSTRUCTIONAL DRAWING (3).** LAB. 6. Preparing for the shop laboratory, including making freehand and pictorial sketches and drawings, reading working drawings, blue prints, manufacturers guides, and lettering, use of instruments, dimensioning, making models, floor plans, bills for materials, writing specifications, and developing working plans.
305. **RECORDS MANAGEMENT (3).** Basic procedures of filing, records storage and control. Practice in record keeping.
310. **SHORTHAND I* (5).** Pr., VED 200 or equivalent. Basic course in Gregg shorthand. Emphasis on recognition of principles; rapid reading of notes; dictation of new material.
311. **SHORTHAND II* (5).** Pr., VED 310. Reinforcement of principles; speed building dictation; development of transcription skills.
312. **SHORTHAND III* (5).** Pr., VED 311. Emphasis on dictation speed and mailable transcription.
315. **MACHINE TRANSCRIPTION (1-3).** Pr., VED 312 and/or COI. Provides instruction and practice in the production of general business correspondence in mailable form from recorded dictation. May be taken more than one quarter for a maximum of 3 credits in order to specialize in legal and/or medical transcription.
346. **VOCATIONAL AND ADULT EDUCATION.** LEC. 2, LAB. 2. Principles and Practices (3). Principles of vocational education and their application in developing and operating preparatory and in-service programs.
352. **MEDICAL TERMINOLOGY FOR HEALTH RELATED OCCUPATIONS (5).** Equips the student with the essential medical terminology for effective communications among the various members of the health team.
354. **CAREERS IN HEALTH RELATED OCCUPATIONS (5).** Identification of role and function in health related occupations including the range of occupations that require minimum training as well as those that require University level education.
356. **HEALTH DELIVERY SYSTEMS (5).** Contemporary and emerging patterns in delivering health services.
400. **INTRODUCTION TO POWER MECHANICS (5).** LEC. 2, LAB. 6. Design and operational theories related to power machines. Internal combustion engines; power trains; hydraulic and cooling systems.
401. **PRACTICUM IN SMALL GASOLINE ENGINES (5).** LEC. 2, LAB. 6. Application of skills and abilities needed in teaching the maintenance and repair of small air cooled engines. Theories of compression, carburetion and ignition; laboratory exercises in repair and maintenance.
402. **AUTOMOTIVE CONSTRUCTION AND REPAIR (5).** LEC. 2, LAB. 6. Theories of design, principles of operation, and maintenance and repair of ignition system, fuel systems, power systems and chassis components.
403. **PRINCIPLES OF ELECTRICITY (1).** LAB. 2. An introductory course in the principles and application of elementary laws governing electricity and its use.
404. **PRACTICUM IN GENERAL METALS (5).** LEC. 2, LAB. 6. Application of skills and abilities needed in the teaching of metal processes applicable to vocational education program in the secondary school. Metal properties; power tools; heat treating; ornamental iron work, cold metal; sheet metal; machining metals; and arc and gas welding.
405. **THE SCHOOL SHOP (3).** Organization and management of the school shop; methods and materials integrated with the study of jobs and problems basic to the teaching of skills in vocational education.
406. **PRACTICUM IN BUILDING CONSTRUCTION AND MAINTENANCE (5).** LEC. 2, LAB. 6. Application of skills and abilities needed in teaching the erections of buildings and other related structures.
407. **PRACTICUM IN ELECTRICITY (4).** LEC. 2, LAB. 4. Application of skills and abilities needed in the teaching of fundamental principles of electricity. Planning and developing projects involving an understanding of electrical principles as applied to materials selection, circuits, motors and devices; and maintenance and servicing of electrical equipment and appliances.
408. **PRACTICUM IN GENERAL SHOP (5).** LEC. 2, LAB. 6. Application of skills and abilities needed in teaching general shop skills to students and clients in school laboratories and rehabilitation centers.
409. **TEACHING ELECTRONICS IN AREA OF SPECIALIZATION (4).** LEC. 2, LAB. 4. Pr., consent of department head. Theories and practices used in school electronic laboratories; projects designed and constructed.
410. **PROGRAMS IN HOME ECONOMICS FOR THE MIDDLE SCHOOL (4).** LEC. 3, LAB. 2. Pr., admission to teacher education and FED 350 or equivalent. Principles of and experiences in designing middle school home economics programs; evaluation of instruction and programs.
411. **TEACHING HOME ECONOMICS EDUCATION (5).** LEC. 4, LAB. 2. Pr., admission to Teacher Education and FED 320 or equivalent. Methods and techniques of instruction using appropriate instructional materials; planning and evaluation of instruction for Home Economics.

*The shorthand and typewriting sequence should be begun at the highest possible level because credit may be gained through advanced placement. With previous training in either, the student may enter the second, third, or fourth quarter course. If a grade of C or higher is earned, credit is given for the lower courses. If a C is not earned, advanced placement credit will not be granted. Consult with OA staff for placement.

412. **PROGRAMS IN HOME ECONOMICS EDUCATION (4). LEC. 3, LAB. 2.** Pr., admission to Teacher Education and FED 320 or equivalent. Principles of and experience in designing programs for home economics; evaluation of instruction and programs.
414. **PROGRAM IN AREA OF SPECIALIZATION (3). LEC. 2, LAB. 2.** Pr., admission to Teacher Education and FED 320 or equivalent. Program planning principles involved in designing program activities for specific areas of specialization.
415. **TEACHING IN AREA OF SPECIALIZATION (3-5). LEC. 2, LAB. 2.** Pr., admission to Teacher Education and FED 320 or equivalent. Understanding of curriculum content; methods and techniques of instruction using appropriate instructional materials; planning and evaluation of instruction for specific area of specialization.
419. **TRANSCRIPTION (5). LEC. 5, LAB. 5.** Pr., VED 312. Emphasis on improved production rates. Continued development of dictation speed. Transcription of letters with special features.
420. **OFFICE MACHINES (3). LAB. 4, LEC. 1.** Pr., junior standing and COI. Designed to give a working knowledge of various machines found in modern offices. Basic training in the use of adding machines, electronic calculators, duplicating, dictating machines, and posting machines. (Optional rotation in machine transcription, excluding Office Administration majors.)
421. **OFFICE INTERNSHIP (10). LAB. 20.** Pr., VED 422, and senior standing. (Supervised work experience open to OA majors only.)
422. **SECRETARIAL PROCEDURES I (5).** Pr., VED 312, and junior standing. Analysis of requirements of profession of executive secretary or administrative assistant.
423. **SECRETARIAL PROCEDURES II (5).** Pr., VED 422, and junior standing. Major activity: The work of several long-term projects in which students benefit from long-range planning, setting of priorities, expediting of solutions to problem situations, and handling volume correspondence.
425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. Evaluation and analysis of the intern experience.
430. **WORD PROCESSING AND OFFICE SYSTEMS (5). LEC. 3, LAB. 4.** An exploration of organizational needs for Word Processing, its impact on organizational structure and work flow; managerial problems involved in planning, implementing, and administering effective Word Processing systems. Lab experiences designed to provide an acquaintance with the functions and capabilities of a word processing system.
446. **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objectives, includes evaluation by professor and student of work accomplished at regular intervals.
450. **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations.
457. **PRACTICUM IN GRAPHIC ARTS INSTRUCTION (3). LAB. 6.** Pr., junior standing. To prepare pre-service and in-service vocational teachers to teach graphic arts skills in printing and duplicating techniques, advertising, display and other modes of graphic communication.
462. **DIRECTED WORK EXPERIENCE IN AREA OF SPECIALIZATION (5). LAB. 10.** Pr., VED 414, In-service, supervised work experience. Individually designed for part-time and/or summer experience.
466. **TEACHING OUT-OF-SCHOOL GROUPS (3).** Pr., VED 414, Conducting surveys, occupational analysis, using advisory committees, organizing, conducting and supervising various types of adult education.
- 475-476-477-478-479-480. **TRADE AND TECHNICAL EXPERIENCE (5-5-5-5-5-5).** An experience completed by Supervised employment or by examination on basis of journeyman level work experience at the maximum rate of 15 quarter hours for each year of such experience. In those occupations where there is no organized apprenticeship experience beyond the level of learner will correspond to starting the curriculum, elective coursework may be substituted for these credits.
495. **PRACTICUM (1-15).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

ADVANCED UNDERGRADUATE AND GRADUATE

508. **TEACHING MECHANICAL TECHNOLOGY (5). LEC. 3, LAB. 4.** Pr., junior standing. Objectives and methods; equipment and management of vocational education shops; organization of projects; recent development in specialized areas of mechanics; in-service teaching problems. Students plan for demonstration of methods for teaching mechanical skills.
510. **OCCUPATIONAL INFORMATION (3). LEC. 2, LAB. 2.** Pr., junior standing. Occupational structure, job qualifications, and requirements, sources of occupational information, current trends, industrial and occupational surveys. Preparation, evaluation, and dissemination of occupational information used by teachers in vocational and technical schools.
513. **NATURE OF ADULT EDUCATION (5).** Pr., junior standing. History and principles of adult education applied to the development and implementation of programs in remedial, occupational, and continuing education.
520. **TEACHING VOCATIONAL EDUCATION TO STUDENT WITH SPECIAL EDUCATION NEEDS (5).** Pr., successful completion of program planning and methods courses. Program development resources for teaching vocational skills to students who are economically and educationally disadvantaged or handicapped.

524. **ADMINISTRATIVE MANAGEMENT (5).** Pr., junior standing. COI. Management of information in many forms, systems design, data collection and processing methods, communications and record management, office physical facilities, other performance standards and control and motivation of personnel.
541. **DEVELOPMENT OF VOCATIONAL EDUCATION (4).** Pr., junior standing. Historical perspective of the development of vocational education with an overview of its nature and purpose relative to the technological society.
550. **CAREER EDUCATION (4).** Pr., junior standing. Introduction of career education as a system concept encompassing the entire educational experience in K-14. Emphasis will be given to the interrelated nature of the role of the administrator, the counselor, and the classroom teacher in career education.
552. **INSTRUCTIONAL PROGRAMS IN THE CONSTRUCTION INDUSTRY (4).** LEC. 2, LAB. 4. Pr., VED 414 or 415 or graduate standing. Preparation of teachers to implement various exploratory programs of a hands-on nature that will permit students to gain insight into career opportunities offered by the construction industry.
554. **INSTRUCTIONAL PROGRAMS IN THE MANUFACTURING INDUSTRY (4).** LEC. 2, LAB. 4. Pr., VED 414 or 415 or graduate standing. Preparation of teachers to implement various exploratory programs of a hands-on nature that will permit students to gain insight into career opportunities offered by the manufacturing industry.
556. **LEARNING RESOURCES IN AREA OF SPECIALIZATION (5).** Pr., junior standing. (A) Agricultural Education; (B) Industrial Arts Education; (C) Trade and Industrial Education; (D) Distributive Education; (E) Rehabilitation; (F) Adult Education; (G) Technical Education; (H) Business; (I) Home Economics; (N) Speech Pathology; (O) Behavior Disturbance; and (P) Mental Retardation.
558. **COORDINATION AND SUPERVISION OF VOCATIONAL EDUCATION PROGRAMS IN AREAS OF SPECIALIZATION (5).** LEC. 4, LAB. 2. Pr., junior standing. Appropriate relationship between school and on the job programs, including records of coordination, student placement, improving employable skills and habits, recruitment and selection of work experience applicants, work experience rotation, public information and other similar activities.
569. **COMMUNITY PROGRAMS IN ADULT EDUCATION (5).** LEC. 4, LAB. 2. Pr., junior standing, VED 513 or COI.
574. **ORGANIZATION OF INSTRUCTION IN VOCATIONAL-TECHNICAL EDUCATION (5).** Pr., junior standing. Trade and occupational analysis, principles and procedures of identifying and selecting the skills and knowledge needed in the preparation of courses of instruction. Principles and procedures of individualizing instruction.
581. **PROBLEMS IN TEACHING THE DISADVANTAGED ADULT (3-5).** Pr., junior standing. Problems of the disadvantaged adult with special emphasis on the unique sociological, psychological, and physiological factors that influence learning and participation in remedial learning activities.

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602. **TEACHER EDUCATION IN VOCATIONAL AND ADULT EDUCATION (5).** For supervisors of student teachers, teacher educators, and other graduate students. Major emphasis on administration of vocational education programs, research, problems which supervising teachers encounter.
603. **PROBLEMS IN AGRICULTURAL OCCUPATIONS (5).** Pr., consent of department head. Securing, organizing and interpreting information for guidance and teaching purposes; curriculum development; developing instruction units and planning teaching activities for on-farm and off-farm occupations.
606. **ORGANIZATION AND UTILIZATION OF COMMUNITY RESOURCES (5).** Pr., consent of department head. Processes through which new ideas and innovations are utilized through community organization to maximize the effective use of physical and human resources.
608. **ADMINISTRATION OF VOCATIONAL AND ADULT EDUCATION (5).** Pr., consent of department head. Preparation of professional personnel for leadership. Content includes philosophy and an application of procedures in administering and supervising new and on-going programs to meet changing socio-economic conditions.
609. **COMPREHENSIVE PLANNING FOR VOCATIONAL EDUCATION (5).** Pr., VED 608. Processes of comprehensive planning for vocational education programs at high school and post high school centers using local, state, and regional data sources.
616. **ORGANIZING AND TEACHING ADULT, POST-SECONDARY AND CONTINUING EDUCATION (5).** Pr., COI. Utilization of principles of andragogy in helping adults who are not full-time students benefit from adult, post-secondary, and continuing education.

Each of the following courses may be taken as (A) Agriculture, (B) Industrial Arts, (C) Trade and Industrial, (D) Marketing & Distributive, (F) Adult, (G) Technical, (H) Business, (I) Home Economics.

625. **INTERNSHIP (3-15).** Supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences accompanied by regularly scheduled, on-campus discussion periods for positive evaluation and analysis of the intern experience.
646. **DIRECTED INDEPENDENT STUDY (1-8).** The student's learning efforts are guided toward desired objectives including evaluation by professor and student of work accomplished at regular intervals.
650. **SEMINAR IN AREAS OF SPECIALIZATION (1-3).** MAY BE REPEATED FOR CREDIT NOT TO EXCEED 10 HOURS. Advanced graduate students and professors pursue cooperatively selected concepts and theoretical formulations.
651. **RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. **CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.

653. **ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION** (5). Program, organization, and development of basic and supplementary materials for guiding teachers, administrators, and school systems in the continuous improvement of curriculum and teaching practices.

654. **EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION** (5). Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.

Prerequisites for the 651, 652, and 654 courses are 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

695. **PRACTICUM** (1-15). Students get experiences closely relating theory and practice, usually carried on simultaneously.

696. **GRADUATE RESEARCH FORUM** (1). May be repeated, but counted only once toward graduation. Presentations by graduate students of research proposals and/or findings. Analysis of procedures and findings.

699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

798. **FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Program Designators — When appropriate, certain sections of the above common offerings are identified by programs within the departments by the use of letter designations as noted below:

(A) Agriculture, (B) Industrial Arts, (C) Trade and Industrial, (D) Distributive, (F) Adult, (G) Technical, (H) Business, (I) Home Economics, (K) Office Administration, and (T) Health Occupations.

Zoology—Entomology (ZY)

Professors Pritchett, Head, Berger, Causey, Dobie, Dusi, Folkerts, Harper, Mason, Mount, and Watson

Associate Professors Alexander, Bradley, Clark, Dixon, Gaylor, Hyche, Ivey, Kouskolekas, Lishak, Lisano, Mirarchi, Mullen, Ramsey, Speake, M. Williams, and Wit

Assistant Professors Baldassarre, Ball, Cane, Estes, Henry, Lawrence, Mack, Sundermann, and A. Williams

Instructor Dalrymple

Adjunct Professor Crozier

Adjunct Associate Professors Frandsen and Current

200. **GENERAL ENTOMOLOGY** (5). LEC. 4, LAB. 3. Pr., BI 103. Fall, Spring. Introduction to the biology and diversity of insects.

201. **MARINE BIOLOGY** (6). LEC. 4, LAB. 4. Pr., BI 101, 102, and 103. Summer. The invertebrates, vertebrates, and marine plants as communities with emphasis on local examples. Taught only at Dauphin Island Sea Laboratory. Credit may not be earned in both ZY 201 and 436.

204. **INSECTS** (3). LEC. 3. Fall. Life processes, occurrence, and importance of insects. Degree credit may not be earned in both ZY 204 and ZY 200 or ZY 502.

205. **WILDLIFE CONSERVATION** (3). LEC. 3. Fall. The history of wildlife conservation in North America and a presentation of current wildlife conservation problems and practices.

207. **BIRDS** (3). LEC. 3. Summer, Winter. An introduction to the biology and diversity of birds. Degree credit may not be earned in both ZY 207 and ZY 522.

209. **BEE CULTURE** (3). LEC. 2, LAB. 3. Spring, Summer, Fall. Manipulation and production of bees and honey, and a consideration of bee diseases.

210. **INTRODUCTION TO OCEANOGRAPHY** (3). LEC. 3. Winter. The earth as a single ecological system, the inter-relationship between the continents and the oceans, major features of the physics, chemistry, geology, and biology of the oceans and their importance to man. Degree credit may not be earned in both ZY 210 and ZY 435.

241. **INTRODUCTION TO MARINE ZOOLOGY** (6). LEC. 3, LAB. 9. Pr., BI 101, 102, and 103. Summer. A general introduction to the Marine environment with emphasis on the local fauna. Taught only at the Gulf Coast Research Laboratory. Credit may not be earned in this course and ZY 210 or ZY 307.

250. **HUMAN ANATOMY** (5). LEC. 3, LAB. 5. Pr., BI 101 or BI 105. All quarters. The structure of the human body combined with a comprehensive study and dissection of a large mammal. Structural similarities and dissimilarities will be emphasized in the laboratory. A common laboratory section will meet one day at the lecture hour and the two-hour dissection laboratories will meet in small groups by sections.

251. **PHYSIOLOGY** (5). LEC. 4, LAB. 3. Pr., BI 103 or ZY 250. All quarters. Function of mammalian systems with emphasis on man. Laboratory exercises will provide students with an opportunity to validate functions on laboratory animals.

300. **GENETICS (5). LEC. 4, LAB. 3.** Pr., BI 101 and college algebra or equivalent, all quarters. Basic genetic principles, theoretical basis for genetic systems, and modern areas of research. Laboratory emphasizes biometrical analysis of experiments using plants and animals. A common laboratory-recitation session will meet on the "fifth day" at the lecture hour, and a two-hour data collecting laboratory will meet in small groups by sections.
301. **COMPARATIVE ANATOMY (5). LEC. 3, LAB. 6.** Pr., BI 103. Winter, Summer. Comparisons of the systems of the vertebrates.
302. **VERTEBRATE EMBRYOLOGY (5). LEC. 3, LAB. 6.** Pr., BI 103. All quarters. Fertilization, cleavage, morphogenesis, and organogenesis of the frog, chick, pig, and human from a descriptive and analytical viewpoint.
303. **PRINCIPLES OF EVOLUTION AND SYSTEMATICS (5). LEC. 5.** Pr., BI 102 or 103. Winter, Summer. The major processes, methods, and philosophic basis for present day concepts of evolution and systematics.
305. **FOREST ENTOMOLOGY (3). LEC. 2, LAB. 3.** Pr., BI 103. Fall, odd years. Entomology in relation to insects of forests and forest products; recognition, life histories, and control of major insects of forests. Forestry students only.
306. **PRINCIPLES OF ECOLOGY (5). LEC. 4, LAB. 3.** Pr., 10 hrs. Biology or COI. Fall, Spring. The physical and biotic factors of the environment and the interactions of these with plants and animals. The organization and functions of communities and populations.
307. **INTRODUCTION TO OCEANOGRAPHY (6). LEC. 4, LAB. 4.** Pr., college algebra, general chemistry, and general physics. Summer. The physics, chemistry, biology, and geology of the oceans. Taught only at the Dauphin Island Sea Laboratory. Credit may not be earned in both ZY 307 and ZY 435.
308. **MICROLOGY (5). LEC-LAB 9.** Pr., BI 103 and CH 207-208 or COI. All quarters. Laboratory methods of fixation, embedding, sectioning, staining, and mounting of animal tissues, and an introduction to techniques of light microscopy.
310. **CELL BIOLOGY (4). LEC. 4.** Pr., 10 hours of General Biology and CH 207. Fall, Winter, Summer. Morphology and physiology of cell membranes, cytoplasm, and the formed elements of the cytoplasm and nucleus. Cell division, molecular transport, cellular homeostasis, and biochemical pathways of energy production.
- 310L. **CELL BIOLOGY LABORATORY (2). LAB. 4.** Pr., ZY 310 or concurrently. Fall, Winter, Summer. Laboratory exercises in cell biology.
316. **PHYSIOLOGY OF DOMESTIC ANIMALS (5). LEC. 4, LAB. 3.** Pr., BI 103. Fall, Spring. Function of mammalian systems with emphasis on domestic mammals. Degree credit may not be earned in both ZY 316 and ZY 251 or ZY 524.
328. **PRINCIPLES OF WILDLIFE MANAGEMENT (4). LEC. 4.** Pr., a course in ecology. Spring. Fundamentals of wildlife management theory, application, and administration.
- 328L. **WILDLIFE MANAGEMENT LABORATORY (1). LAB. 3.** Pr., ZY 328 or concurrently. Fall. Laboratory experiences in wildlife management.
360. **PHYSIOLOGICAL ASPECTS OF AGING (3). LEC. 3.** Pr., BI 101. Summer. The effects of aging and disease states associated with aging upon the functional status of the various organs and systems of the body.
405. **APPLIED ENTOMOLOGY (5). LEC. 4, LAB. 3.** Pr., ZY 200. Spring. Biology, economic importance and management of the more important insect pests in each of the various agricultural commodity groups.
406. **ALTERNATIVE METHODS OF INSECT PEST MANAGEMENT (5). LEC. 3.** Pr., ZY 405. Fall. An introduction to insect management tactics other than chemical insecticides.
425. **FOREST WILDLIFE MANAGEMENT (3). LEC. 3.** Pr., FY 520 or COI. Winter. Wildlife management as applied to forest properties. Restricted to students in forestry.
433. **FISH AND WILDLIFE LAW ENFORCEMENT (3). LEC. 3.** Pr., junior standing. Spring, odd years. History, principles, and techniques of fish and wildlife laws and enforcement. Restricted to students in Fisheries, Forestry, and Wildlife Management.
435. **GENERAL OCEANOGRAPHY (3). LEC. 3.** Pr., acceptable physics, chemistry, and mathematics background. Winter. Physical, chemical and geological characteristics of the oceans, especially as they relate to present understanding of marine ecology and the biological productivity of marine waters.
436. **MARINE BIOLOGY (3). LEC. 3.** Pr., invertebrate zoology, general physiology. Winter. Marine organisms, their physiological adaptations to the environment, with emphasis on respiration, nutrition and feeding, osmoregulation, reproduction, and biological associations in the context of ecology.
490. **WILDLIFE MANAGEMENT INTERNSHIP (5 HRS. PER QUARTER, 15 HRS. MAXIMUM.)** COI, SU graded. Provides the student with practical job experience under joint supervision of the internship adviser and appropriate state, federal, or private agency. Training will prepare student for potential career employment.
491. **ENTOMOLOGY INTERNSHIP (UP TO 5 HRS. PER QUARTER, MAXIMUM 15 HRS.)** COI, SU graded. Provides the student with practical job experience under joint supervision of the internship adviser and appropriate state, federal, or private agency. Training will prepare student for potential career employment.
498. **SPECIAL PROBLEMS (1-3).** Pr., senior standing. A. Zoology; B. Entomology; C. Wildlife Management. D. Marine Biology. A student can register for a total of not more than three hours credit.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **INVERTEBRATE ZOOLOGY (5). LEC. 3, LAB. 6.** Pr., BI 103. Winter. Biology, taxonomy, and ecology of invertebrate animals.

502. **ECONOMIC ENTOMOLOGY (5).** LEC. 4, LAB. 3. Fall, Spring. Consideration of the biological aspects, life histories, and control of insects. Not for graduate credit for students in School of Agriculture departments.
503. **TOXICOLOGY OF INSECTICIDES (5).** LEC. 4, LAB. 3. Winter. Toxic actions of insecticides; formulations, application methods and uses of insecticides; research methods and uses of insecticides; research methods in insect toxicology; insecticide residues in relation to man and the environment.
504. **MEDICAL & VETERINARY ENTOMOLOGY (5).** LEC. 4, LAB. 3. Pr., ZY 200. Spring, even years. Insects, mites, and other arthropods of medical or public health importance with emphasis on recognition and biology of pest species and the epidemiology of arthropod-borne diseases.
505. **FOREST INSECTS (5).** LEC. 4, LAB. 3. Pr., ZY 200, 305, or 502. Spring. Principal insects of forests and forest products; their importance, taxonomy, bionomics, and control.
506. **IMMATURE FORMS OF INSECTS (5).** LEC. 2, LAB. 6. Pr., ZY 200. Winter. Structure and identification of immature forms of insects; methods of collecting and preserving; development and use of keys for classifying immature insects.
507. **GENERAL INSECT MORPHOLOGY (5).** LEC. 3, LAB. 6. Pr., ZY 200. Winter. Comparative external anatomy and generalized internal structures of insects; characteristics used in taxonomy will be emphasized.
509. **HISTOLOGY (5).** LEC. 3, LAB. 6. Pr., BI 103. Fall, Winter, Summer. Morphology and classification of tissues; arrangement of tissues in organs and systems of vertebrate animals.
510. **SYSTEMATIC ENTOMOLOGY (5).** LEC. 3, LAB. 6. Pr., ZY 200. Spring. Principles of systematics and identification of insects through orders, families, genera, and species.
511. **GENERAL PARASITOLOGY (5).** LEC. 3, LAB. 6. Pr., BI 103. Fall, Spring, Summer. Origin, adaptations, physiology, and ecology of parasites. Identification and life histories of representative parasitic protozoa, helminths, and arthropods with emphasis on host-parasite relationships.
514. **AQUATIC INSECT BIOLOGY (5).** LEC. 3, LAB. 6. Pr., ZY 200. Fall. Ecology, systematics, and identification of aquatic and semiaquatic insects. Some emphasis will be placed on groups of significance in food webs or of value as indicator organisms. A collection will be required. Some weekend field trips will be taken.
515. **LIMNOLOGY (5).** LEC. 3, LAB. 6. Pr., CH 104, PS 205, BI 103. Spring. Biological, chemical, and physical factors affecting aquatic life.
516. **STUDIES IN FIELD BIOLOGY AND ECOLOGY (10).** Pr., major or minor in a biological field. COI; junior standing. Summer, odd years. A field trip away from the southeastern United States. Practical experience in the collection and preservation of specimens. Studies of basic ecological phenomena in a field situation. Stops at institutions to visit outstanding biologists and see field biology research in action. May not be taken concurrently with other courses. A fee, varying with the nature and extent of the trip, will be charged.
517. **PRINCIPLES OF POPULATION GENETICS (5).** LEC. 4, LAB. 3. Pr., ZY 300. Spring. The origin, maintenance and expression of genetic variability in natural populations. Designed especially for students planning to work with populations of organisms, whether with aspects of management, breeding, or control.
518. **MON-MENDELIAN GENETICS (3).** Pr., ZY 300. Fall. Current status of behavioral, cytogenetic, cytoplasmic, developmental, and recombinational genetics.
519. **MOLECULAR GENETICS (3).** Pr., ZY 300. Winter, even years. Current status of molecular genetics; nucleic acids, regulation, mutagenesis, and immunology will be considered.
520. **HUMAN GENETICS (5).** LEC. 5. Pr., ZY 300, CH 208. Spring, Summer. Effects of normal and abnormal chromosome complements, the biological interaction of genes, and the effects of mutation and changes in gene frequency on human populations; problems in small sample analysis, biochemical screening of human "carriers," and the prospects for genetic engineering.
521. **VERTEBRATE ZOOLOGY I (5).** LEC. 3, LAB. 6. PR., BI 103. Fall, Spring. Natural history of fishes, amphibians, and reptiles.
522. **VERTEBRATE ZOOLOGY II (5).** LEC. 3, LAB. 6. Pr., BI 103. Fall, Summer. Taxonomy, ecology, evolution, and some biological principles of birds and mammals. Laboratory studies in radio-telemetry, bioacoustics, and population dynamics are used in addition to classical vertebrate zoology exercises.
524. **ANIMAL PHYSIOLOGY (5).** LEC. 4, LAB. 3. Pr., Biochemistry or ZY 310, CH 208. Winter, Summer. General physiological principles common to animals of various vertebrate taxa illustrated with examples that are most demonstrative. An effort is made to include unique physiological adaptations.
527. **WILDLIFE PHILOSOPHY, POLICY, AND PUBLIC RELATIONS (3).** LEC. 3. Pr., a course in natural resource management. Fall. Examination of attitudes, philosophies, and policies that govern management of the wildlife resource. Modern methods used in dealing with the public to implement wildlife policies. Intended for students interested in employment with public or private agencies dealing with natural resources.
528. **WILDLIFE BIOLOGY (4).** LEC. 4. Pr., ZY 328 or concurrent. Winter. The ecology and management of selected wildlife species of the U.S. Emphasis on natural history, census methods, and management strategies.
- 528L. **WILDLIFE BIOLOGY LABORATORY (2).** LAB. 6. Pr., ZY 528 or concurrent. Winter. Practical laboratory exercises designed to acquaint the student with modern methodology and techniques in studying wild bird and mammal population.
531. **WILDLIFE HABITAT ANALYSIS (3).** LEC. 1, LAB. 6. Pr., ZY 528, BY 506. Spring. Practical exercises in vegetation analysis, utilization studies, aerial photograph interpretation, and cover type mapping.

536. **COMMUNITY ECOLOGY OF MARINE ECOSYSTEMS (3).** LEC. 3, Pr., ZY 435 or COI. Spring. The ecology of coastal and oceanic ecosystems. The dynamics and regulation of population distribution and abundance within terrestrial, intertidal, and subtidal communities.
538. **GENERAL ICHTHYOLOGY (5).** LEC. 3, LAB. 6, Pr., BI 103. Fall. Survey of functional morphology, classification and distribution of fishes. Introduction to faunistic literature of North America and the world. Identification of fishes from the Gulf of Mexico and North American fresh waters.
542. **MARINE FISHERIES MANAGEMENT (6).** LEC. 3, LAB. 9, Pr., 18 hrs. of biology including BI 103. Summer. Fisheries management philosophy, objectives, problems, and principles involved in management decisions. Offered only at the Gulf Coast Laboratory, Ocean Springs, Mississippi.
543. **MARINE VERTEBRATE ZOOLOGY AND ICHTHYOLOGY (9).** LEC. 5, LAB. 12, Pr., 18 hours of biology including BI 103. Summer only. The marine chordata, including lower groups and the mammals and birds, with most emphasis on the fishes. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
545. **MARINE INVERTEBRATE ZOOLOGY (9).** LEC. 5, LAB. 12, Pr., 18 hrs. biology including BI 103 and ZY 501. Summer. The marine invertebrates, especially those of the Mississippi Sound region. Emphasis is placed on the structure, classification, phylogenetic relationships, and functional processes. Offered only at the Gulf Coast Laboratory, Ocean Springs, Mississippi.
548. **MARINE ECOLOGY (7½).** LEC. 3, LAB. 6, Pr., BI 102, ZY 501, and acceptable chemistry. Summer. The relationship of marine organisms to their environment, and the effects of the environment on the abundance and distribution of marine organisms. Offered only at the Gulf Coast Laboratory, Ocean Springs, Mississippi.
550. **ZOOGEOGRAPHY OF THE VERTEBRATES (5).** LEC. 4, LAB. 3, Pr., ZY 521, or COI. Spring, odd years. Principles of geographic distribution of vertebrate animals.
551. **MARINE INVERTEBRATE ZOOLOGY I (6).** LEC. 4, LAB. 4, Pr., BI 101 and 103. Summer. The taxonomy, life cycles, ecology, and evolution of the lower invertebrates, Protozoa through Mollusca. Taught only at the Dauphin Island Sea Laboratory. This course may not be substituted for ZY 501.
552. **MARINE INVERTEBRATE ZOOLOGY II (6).** LEC. 4, LAB. 4, Pr., ZY 410. Summer. A continuation of ZY 410 including the Annelida through the Protochordata. Taught only at the Dauphin Island Sea Laboratory. This course may not be substituted for ZY 501.
553. **MARINE VERTEBRATE ZOOLOGY (6).** LEC. 4, LAB. 4, Pr., BI 101, 103 and COI. Summer. The systematics, zoogeography, and ecology of marine fishes, reptiles, and mammals. Taught only at the Dauphin Island Sea Laboratory. This course may not be substituted for ZY 521 and/or ZY 522.
554. **COASTAL ORNITHOLOGY (6).** LEC. 3, LAB. 9, Pr., ZY 522. Summer. Coastal and pelagic birds with emphasis on ecology, taxonomy, and distribution. Taught only at the Dauphin Island Sea Laboratory. This course may not be substituted for ZY 605.
555. **MARINE ECOLOGY (6).** LEC. 3, LAB. 9, Pr., ZY 306, college physics and chemistry, and COI. Summer. Bioenergetics, community structure, population dynamics, predation, competition, and speciation in marine ecosystems. Taught only at the Dauphin Island Sea Lab.
556. **BEHAVIOR AND NEUROBIOLOGY OF MARINE ANIMALS (6).** LEC. 5, LAB. 10, Pr., 20 hours of Zoology, Psychology, and COI. Survey of the behavior, neuroanatomy, and neurophysiology of selected marine invertebrates and vertebrates. Taught only at the Gulf Coast Research Laboratory.
560. **MAMMALIAN PHYSIOLOGY I (5).** LEC. 4, LAB. 3, Pr., CH 208, ZY 250 or equivalent, and ZY 310 or Biochemistry. Fall, Spring. A treatment of cellular bioelectric phenomena, muscle contractility, neurophysiology, and cardiovascular physiology. Laboratory will utilize modern methodology for the observation of physiological fact.
561. **MAMMALIAN PHYSIOLOGY II (5).** LEC. 4, LAB. 3, Pr., ZY 560 or equivalent. Winter, Summer. A continuation of ZY 560 with emphasis upon respiratory, renal, digestive, metabolic, and endocrine physiology.
565. **ETHOLOGY (5).** LEC. 4, LAB. 3, Pr., ZY 306, 522, 524 or COI. Spring. Animal behaviors, analysis of their adaptive values, development, and evolution.

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601. **INSECT MORPHOLOGY AND DEVELOPMENT (5).** LEC. 3, LAB. 6, Pr., ZY 507. Fall, odd years. A comparative study of selected arthropod structures and a consideration of embryological development and metamorphosis in insects.
603. **INSECT PHYSIOLOGY (5).** LEC. 3, LAB. 6, Pr., ZY 524 and ZY 601. Spring, even years. General and comparative physiology of the organ systems of insects. A minimum of two literature reviews will be made by each student during the quarter.
605. **ORNITHOLOGY (5).** LEC. 3, LAB. 6, Pr., ZY 522. Spring. Ecology and behavior of birds.
606. **MAMMALOLOGY (5).** LEC. 3, LAB. 6, Pr., ZY 522. Winter. Taxonomy, ecology, and behavior of mammals.
607. **UPLAND WILDLIFE ECOLOGY (5).** LEC. 3, LAB. 6, Pr., BY 506, BY 513, ZY 528, or COI. Fall, odd years. Application of wildlife ecological theories, techniques, and administration with special emphasis on upland species. Field trips will be made, including at least 4 overnight weekend trips.
608. **FOREST WILDLIFE ECOLOGY (5).** LEC. 5, Pr., ZY 528. Summer, even years. Intensive investigations into current aspects of the ecology and management of the important forest wildlife species of North America.
609. **ADVANCED APPLIED ENTOMOLOGY (5).** LEC. 4, LAB. 3, Pr., ZY 502. Fall, even years. Integrated control of the principal insects by environmental, biological, genetic, chemical, and legal means.

611. **PRINCIPLES OF SYSTEMATIC ZOOLOGY (5).** LEC. 6. Pr., ZY 303. Winter, odd years. Contemporary systematic philosophies including the species problem, phylogeny, and classification.
612. **ADVANCED INSECT TOXICOLOGY (5).** LEC. 4, LAB. 3. Pr., ZY 604. Spring, odd years. Mode of action, mode of entry, relation of chemical structure to toxicity, and precision methods of determination of insecticides; recent developments in the field of insecticide chemistry.
613. **INSECT PATHOLOGY (5).** LEC. 3, LAB. 4. Pr., BY 300, ZY 200, or equivalent and COI. Winter, even years. The micro-organisms associated with diseases in insects and their pathological effects on insects and insect populations.
614. **BIOLOGICAL CONTROL OF INSECTS (5).** LEC. 4, LAB. 3. Pr., ZY 200, or equivalent and COI. Spring, odd years. Biology, ecology, classification, and behavior of predators, parasites, and disease agents influencing insect populations. Utilization of biotic agents for management of pest populations.
615. **POPULATION DYNAMICS AND INTRODUCTORY MODELLING FOR BIOLOGISTS (5).** LEC. 3, LAB. 6. Pr., ZY 306 or its equivalent and BY 501, and knowledge of FORTRAN or BASIC is essential. Spring. Quantitative methods for analyzing the population dynamics of organisms; also an introduction to design, construction, and evaluation of deterministic simulation models.
616. **SYSTEMATIC ICHTHYOLOGY (3).** LEC. 1, LAB. 6. Pr., ZY 538 or FAA 538. Winter, odd years. Fishes of the world; their morphology, distribution and use to man. Emphasis on individual work with world faunistic literature, revisions and museum materials.
618. **ADVANCED INVERTEBRATE ZOOLOGY (5).** LEC. 3, LAB. 6. Pr., ZY 501 or COI. Spring, odd years. The biology of minor invertebrate phyla with special emphasis on morphology and taxonomy.
619. **COMPARATIVE INVERTEBRATE PHYSIOLOGY (5).** LEC. 4, LAB. 3. Pr., ZY 501 and COI. Spring, odd years. The physiological mechanisms of invertebrates with special emphasis on respiration, excretion, reproduction, locomotion, nutrition, circulation, and behavior.
620. **ARACHNOLOGY (5).** LEC. 3, LAB. 6. Pr., ZY 200. Spring, odd years. Biology, behavior, and systematics of arachnids with major emphasis on spiders and mites.
622. **HISTORY AND LITERATURE OF ZOOLOGY (4).** LEC. 3, LAB. 3. Pr., graduate standing. Fall, even years. A historical review of the classical authors and great works in zoological literature. Laboratory will concentrate on examining and learning to use journals, abstracts, and reference materials in the library.
623. **ORGANIC EVOLUTION (5).** Pr., ZY 300. Fall. Evolutionary principles as illustrated by the various biological disciplines, particularly genetics, paleontology, zoogeography, and systematics in general.
627. **IMMUNOLOGY AND PHYSIOLOGY OF PARASITES (5).** LEC. 3, LAB. 6. Pr., ZY 511, BY 300, ZY 524, and COI. Spring, odd years. Immunity mechanisms to infections of protozoan and helminth parasites. Chemical physiology of host-parasite relationship to include nutrition, metabolism, toxicity, and chemotherapy.
629. **POPULATION GENETICS, ECOLOGY, AND EVOLUTION (3).** LEC. 3. Pr., ZY 300, ZY 303, ZY 306, or COI. Fall, odd years. Introduction to the genetical architecture of natural populations as it relates to ecology, evolution, and population biology in general.
630. **ADVANCED GENETICS (5).** Pr., ZY 300 and ZY 518. Winter, odd years. Non-Mendelian hereditary systems; regulation of gene action as it influences growth, differentiation, and development; and the status of contemporary genetics research.
631. **DEVELOPMENTAL GENETICS (3).** Pr., ZY 300, ZY 302, ZY 519, Coreq. ADS 519. Winter, odd years. Gene action on the biochemical level pertaining to early development, growth and differentiation, and aging. Principles of gene regulation and organization derived from both prokaryotic and eukaryotic systems are discussed.
632. **HELMINTHOLOGY (5).** LEC. 3, LAB. 6. Pr., ZY 511. Spring, even years. Advanced morphology, physiology, life cycles, and host-parasite relationships of helminths. Opportunity for making extensive literature studies and collections of the parasites of a particular group of animals in which the student is most interested.
634. **PROTOZOOLOGY (5).** LEC. 3, LAB. 6. Pr., ZY 511. Winter. Free-living and parasitic protozoa important to agriculture, wildlife, and man. Morphology, physiology, reproduction, ecology, and life histories will be emphasized.
635. **WATERFOWL BIOLOGY AND MANAGEMENT (5).** LEC. 3, LAB. 6. Pr., ZY 526. Winter, even years. Taxonomy, biology, and management of waterfowl of the world; emphasis on North American species.
636. **POPULATION ECOLOGY (5).** LEC. 5. Pr., ZY 306. Winter. Structure, dynamics, and natural regulatory mechanisms of animal populations; survival strategies emphasizing reproduction, competition, and adaptations to environmental changes.
637. **HERPETOLOGY (5).** LEC. 1, LAB. 8. Pr., ZY 521. Summer, odd years. The morphology, taxonomy, ecology, and behavior of amphibians and reptiles. Laboratory collecting, preserving, and identification of local specimens will be an important consideration.
644. **PHYSIOLOGY OF THE CELL (3).** Pr., ZY 310 and 524. Winter, even years. Basic physiological processes at the cellular level with the tools and approaches of physical science.
645. **NEUROBIOLOGY (5).** LEC. 3, LAB. 6. Pr., ZY 524. Winter, odd years. The nervous system of the vertebrate animal, emphasizing (1) a study of the physiology of the peripheral nervous system on a cellular basis and (2) regulation of somatic and visceral structures via central integration and peripheral pathways.
647. **ENDOCRINOLOGY (5).** Pr., ZY 524 and ADS 519. Spring. A comprehensive treatment of the classical and modern literature of endocrinology.

648. **EXPERIMENTAL ENDOCRINOLOGY (5). LAB. 10.** Pr., ZY 647 or taken concurrently. Spring, odd years. Laboratory studies of endocrine control mechanisms utilizing surgical, bioassay, biochemical assay, histochemical, and autoradiographic methods and techniques.
649. **PHYSIOLOGICAL ECOLOGY (4). LEC. 3, LAB. 3.** Pr., ZY 524 or COI. Spring, even years. The physiological adaptations of animals to the specific physical and biotic environments in which they live.
650. **PROBLEMS IN MARINE ANIMAL PHYSIOLOGY (6). LEC. 4, LAB. 6.** Pr., cell physiology or biochemistry and COI. Comparative physiology of marine animals, stressing biochemical mechanisms of osmoregulation, temperature control and respiration. Taught at Dauphin Island Sea Lab.
651. **OCEANOLOGY OF THE GULF OF MEXICO (5). LEC. 3, LAB. 4.** Pr., a course in oceanography and COI. The oceanology of the Gulf of Mexico and adjacent waters. The areas of study will include the coastal zone, continental shelf and deep ocean. Taught at Dauphin Island Sea Lab.
652. **MARINE ZOOGEOGRAPHY (5). LEC. 3, LAB. 6.** Pr., a course in marine biology and COI. Historical, physical and biological factors influencing the distribution of marine organisms. Emphasis: the Western North Atlantic. Taught in Dauphin Island Sea Lab.
653. **ESTUARINE SCIENCE (6). LEC. 6, LAB. 6.** Pr., COI. The physical, chemical, and biological parameters of estuarine ecosystems indepth. Structured to provide field experience in addition to lecture material. Taught at Dauphin Island Sea Lab.
693. **SEMINAR. (CREDIT TO BE ARRANGED.)**
698. **SPECIAL PROBLEMS (2-5).** All quarters. A. Zoology; B. Entomology; C. Wildlife. Numerous study areas are available under each of these categories. Consult individual faculty member before registering.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
799. **DOCTORAL RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Faculty and Staff

1985-86

(The parenthetical designation after a faculty member's title indicates his department. The first date after the title indicates the year of first appointment to any position in the institution; the second, the year of appointment of present rank.)

GENERAL ADMINISTRATIVE OFFICERS

- MARTIN, JAMES E., *President*, 1984. B.S., Auburn; M.S., N. Carolina State; Ph.D., Iowa State
- EMERT, GEORGE H., *Executive Vice President*, 1984. B.A., Colorado; M.A., Colorado State; Ph.D., Va. Tech
- BRANDT, WARREN W., *Vice President for Academic Affairs*, 1984. B.S., Michigan State; Ph.D., Illinois (Sciences); 1965, 1981. B.S., M.S., Auburn; Ph.D., Texas A & M
- PARKS, PAUL F., *Vice President for Research and Dean of the Graduate School, Professor (Animal and Dairy Sciences)*, 1965, 1981. B.S., M.S., Auburn; Ph.D., Texas A & M
- BAILEY, WILFORD S., *President Emeritus and University Professor*, 1942; 1984. D.V.M., M.S., Auburn; Sc.D., Johns Hopkins
- BARNES, PAT H., *Dean of Students*, 1983. B.A., Texas Woman's; M.Ed., Ed.D., Auburn
- BRADBERRY, GEORGE L., *Executive Director of Alumni Association and Director of Development*, 1951, 1979. B.S., Georgia
- BUCHANAN, GALE A., *Dean & Director, Agricultural Experiment Station*, 1965, 1980. B.S., M.S., Florida; Ph.D., Iowa State
- DYE, PATRICK F., *Athletic Director and Head Football Coach*, 1981. B.S., Georgia
- LEISCHUCK, EMILY R., *Assistant to the President*, 1974, 1983. B.S., Alabama; M.Ed., Auburn
- LEISCHUCK, GERALD S., *Director, Institutional Analysis*, 1962, 1966. A.B., M.A., N. Carolina; Ed.D., Auburn
- RILEY, RHETT E., *Treasurer and Business Manager*, 1963, 1983. B.S., Auburn
- THOMPSON, ANN E., *Director, Alabama Cooperative Extension Service*, 1984. B.S., Auburn; M.A., Maryland; Ed.D., Oklahoma State
- WHITE, J. HERBERT, *Director, University Relations*, 1960, 1983. B.S., Auburn

ACADEMIC ADMINISTRATIVE OFFICERS AND FACULTY

- VOITTE, ROBERT A., *Dean of Agriculture*, 1981. B.S., M.S., W. Virginia; Ph.D., Tennessee
- McPHEETERS, E. KEITH, *Dean of Architecture & Fine Arts and Professor (Architecture)*, 1969. B.Arch., Oklahoma State; M.F.A., in Architecture, Princeton
- HOBBS, EDWARD H., *Dean of Arts & Sciences & Professor (Political Science)*, 1967. A.B., N. Carolina; M.A., Alabama; Ph.D., Harvard
- JONES, ETHEL, *Acting Dean of Business*, 1975, 1984. A.B., Vassar; M.A., Ph.D., Chicago
- BLACKBURN, JACK E., *Dean of Education*, 1975. B.S., FSU; M.A. Peabody; Ed.D., New York
- BRAMLETT, GENE A., *Dean of Extension & Public Service*, 1975, 1980. B.S., Murray State; M.S., Ph.D., Kentucky
- WEAVER, LYNN E., *Dean of Engineering*, 1982. B.S., Missouri; M.S., SMU; Ph.D., Purdue
- GALBRAITH, RUTH L., *Dean of Home Ec. & Professor (Consumer Affairs)*, 1970, 1973. B.S., Ph.D., Purdue
- BROWER, H. TERRI, *Dean & Professor of Nursing*, 1985. B.S.N., M.A. (Nursing); Ed.D., Nova
- COOPER, BEN F., *Dean of Pharmacy & Professor*, 1973. A.B., B.S., M.S., Ph.D., N. Carolina
- VAUGHAN, JOHN T., *Dean of Veterinary Medicine*, 1974, 1977. D.V.M., M.S., Auburn
- AADLAND, ROLF K., *Assistant Professor (Geology)*, 1980. B.S., Houston; M.S., Nebraska; Ph.D., Idaho
- ABNEY, LOUIS O., *Professor (Art)*, 1950, 1967. B.A.A., M.A.A., Auburn
- ADAMS, FREDERICK P., *Associate Professor (Management)*, 1973, 1981. B.S.E.E., Auburn; B.S.I.M., MIT; M.B.A., Alabama; Ph.D., FSU
- ADAMS, JAMES W., *Associate Professor (Market. & Transp.)*, 1969. B.B.A., M.B.A., D.B.A., Georgia State
- ADAMS, MURRAY, JR., *Associate Professor & Head (Soc. & Anthro. & Social Work)*, 1964, 1979. B.A., M.A., Mississippi; Ph.D., Kentucky
- ADAMS, OWEN E., *Librarian II (Library)*, 1983. B.A., Our Lady of the Lake; M.S.L.S., FSU
- ADERHOLD, ROBERT W., *Professor (Build. Science)*, 1969, 1983. B.M.E., Auburn; M.S.M.E., Auburn; Ph.D., Ga. Tech
- ADRIAN, JOHN L., JR., *Professor (Ag. Ec. & Rural Soc.)*, 1974, 1984. B.A.A., M.S., Auburn; Ph.D., Tennessee
- ALDERMAN, C. WAYNE, *Associate Professor (Acct. & Fin.)*, 1977, 1982. B.S., M.B.A., Auburn; D.B.A., Tennessee
- ALBERT, R. A., JR., *Professor (S. An. Surg. & Med.)*, 1962, 1982. D.V.M., M.S., Auburn
- ALDRIDGE, M. DAYNE, *Assistant Dean, Research & Dir., Engr. Exper. Station*, 1984. B.S.E.E., V. Virginia; M.E.E., Sc.D., Virginia
- ALEXANDER, DAVID E., *Associate Professor (Music)*, 1972, 1984. B.M., M.M., Texas
- ALEXANDER, HERMAN D., *Associate Professor (Zoo-Entomol.)*, 1950, 1966. B.S., M.S., Ph.D., Auburn
- ALEXANDER, MILTON J., *Professor (Management)*, 1968, 1975. B.S., Illinois; M.B.A., St. Louis; D.B.A., Georgia State
- ALEXANDER, VANCE L., *Assoc. Professor (Clin. Pharm. Prac.)*, 1975, 1981. B.S., M.S., Houston, J.D., Birmingham School of Law
- ALFORD, WILLIAM L., *Associate Dean (Arts & Sciences) & Professor (Physics)*, 1952, 1964. B.A., Vanderbilt; M.S., Ph.D., California Tech
- ALLEN, ELIZABETH G., *Associate Professor (Curr. & Teach.)*, 1969, 1975. B.A., Alabama; M.Ed., Ph.D., S. Mississippi

- ALLEN, THOMAS, *Asst. Mgr., Mdse., University Bookstore*, 1973, 1984.
- ALLEN, WARD SYKES, *Hargis Professor (English)*, 1964, 1973. B.A., M.A., Ph.D., Vanderbilt
- ALLEY, ALVIN D., *Professor (Curt. & Teach.)*, 1966, 1980. B.A., M.A., Ph.D., FSU
- ALLISON, ZOE A., *Assistant Professor (Cons. Aff.)*, 1984. B.A., Washington State; M.F.A., Idaho
- ALVERSON, WILLIAM J., JR., *Assistant Dean (Agriculture)*, 1965, 1983. B.S., M.Ed., Auburn
- AMLING, HARRY J., *Professor (Horticulture)*, 1958, 1968. B.S., Rutgers; M.S., Delaware; Ph.D., Michigan State
- ANDELSON, ROBERT V., *Professor (Philosophy)*, 1965, 1973. A.B. equiv., Chicago; A.M., Ph.D., S. Calif.
- ANDERSON, GLENN A., *Humanities Ref. Librarian & Librarian II (Library)*, 1978. B.A., M.A., SUNY; M.L.S., FSU
- ANDREWS, GLENN M., *Assistant Professor (Vocat. & Adult Ed.)*, 1975, 1980. B.A., Maryland; M.Ed., Ed.D., Auburn
- ANDREWS, PHILIP, *Assistant Professor (Art)*, 1984. B.A.A., M.A.A., Auburn
- ARMENAKIS, ACHILLES A., *Director, A.T.A.C. and Professor (Management)*, 1973, 1983. B.S., M.B.A., Louisiana Tech.; D.B.A., Miss. State
- ARROYO, A. ANTONIO, *Assistant Professor (Elect. Engr.)*, 1982. B.S.E.E., M.S.E.E., Ph.D., Florida
- ASKEW, RAYMOND F., *Professor (Physics)*, 1960, 1980. B.S., Birmingham-Southern; M.S., Ph.D., Virginia
- ASMUTH, JOHN C., *Head Swimming Coach, Athletic Dept.*, 1980, 1982. B.A., Auburn
- ATCHLEY, Academic Adviser, (*Adm. Home Economics*), 1983, 1984. B.S., Athens; M.Ed., Alabama A&M; M.A., Tenn. Tech
- ATKINSON, CONNIE A., *Health Nurse, Drake S.H.C.*, 1983. B.S.N., Alabama-Birmingham
- ATTLINGER, MARIE H., *Professor (Microbio.)*, 1947, 1981. D.V.M., M.S., Auburn; Ph.D., Alabama
- AULL, JOHN L., *Associate Professor (Chemistry)*, 1974, 1980. A.B., N. Carolina; Ph.D., N. Carolina State
- AULT, RICHARD W., *Assistant Professor (Economics)*, 1983. B.A., W. Virginia; Ph.D., Virginia
- AVERTY, A. HENRY, *Director, Birmingham Office, Engr. Extension*, 1972. B.M.E., Auburn; M.S.I.M., Purdue
- AYERS, F. KEITH, *Assistant Editor, University Relations*, 1984. B.A., Auburn
- AZAR, RUTH A., *Assistant Professor (Nutrition & Foods)*, 1981. B.S., Alabama; M.S., Auburn
- BACKHAUS, JUERGEN, *Associate Professor (Economics)*, 1980. B.A., M.A., J.S.D., Konstanz
- BACKMAN, PAUL A., *Professor (Bot., Plant Path. & Microb.)*, 1971, 1983. B.S., Ph.D., California
- BACKMAN, CARL B., *Assistant Professor (Sociology)*, 1984. A. B., Yale; M.A., Ph.D., Cornell
- BAGWELL, JAMES E., *Assistant Professor & Acting Head (Geography)*, 1950, 1956. B.S., M.S., N. Carolina
- BAILEY, WILFORD S., *President Emeritus & University Professor (Path. & Parasit.)* 1942, 1984. D.V.M., M.S., Auburn; Sc.D., Johns Hopkins
- BAIRD, HAL, *Baseball Coach, Athletic Dept.* 1984. B.S., Ed.M., East Carolina
- BAKER, CLINTON A., *Professor (Market. & Transp.)*, 1974. B.S., Louisville; M.B.A., D.B.A., Indiana
- BAKER, J. M., *Professor (Chemistry)*, 1957, 1965. B.S., Missouri Valley; M.S., Ohio State; Ph.D., Missouri
- BAKER, RICHARD A., *Professor & Head (Voc. & Adult Ed.)*, 1963, 1976. B.S., M.A., Ed.D., Oklahoma State
- BALDASSARRE, GUY A., *Assistant Professor (Zoo-Entomol.)*, 1982. B.S., Maine; M.S., Wisconsin; Ph.D., Texas Tech
- BALDWIN, STEWART L., *Assistant Professor (Mathematics)*, 1981. B.A., Ph.D., Colorado
- BALES, JOHN W., *Adj. Asst. Professor (Mathematics)*, 1984. B.A., M.A., Texas; Ph.D., Auburn
- BALL, MARY U., *Assistant Professor (Zool.-Entomo.)*, 1974. B.S., Trinity; M.S., Ph.D., Texas A&M
- BALL, RAIFORD M., *Adjunct Asst. Professor (Physics)*, 1980. B.S., Trinity; M.S., Ph.D., Texas A&M
- BALL, RICHARD WILLIAM, *Professor (Mathematics)*, 1954, 1960. B.A., M.A., Ph.D., Illinois
- BARBIN, ALLEN RAY, *Professor (Mech. Engr.)*, 1961, 1967. B.S.M.E., Lamar Tech; M.S.M.E., Texas A&M; Ph.D., Purdue
- BARKER, KENNETH N., *Professor & Head (Pharmacy)*, 1975, 1977. B.S.P., M.S.P., Florida; Ph.D., Mississippi
- BARKER, LARRY L., *Alumni Professor (Speech Comm.)*, 1976. A.B., M.A., Ph.D., Ohio
- BARNELA, SATISH B., *Research Associate (Chemistry)*, 1983. M.S., Nagpur; Ph.D., Bombay
- BARNES, PAT H., *Dean of Students*, 1973, 1983. B.A., Texas Woman's; M.Ed., Ed.D., Auburn
- BARNES, PETER A., *Walter Professor (Physics)*, 1970, 1984. B.A.Sc., M. Sc., Waterloo; Ph.D., Simon Fraser U.-British Columbia
- BARNETT, ANDY H., *Associate Professor (Economics)*, 1982. B.A., Presbyterian; M.A., Clemson; Ph.D., Virginia
- BARRY, MARY E., *Associate Professor (Consumer Affairs)*, 1973, 1983. B.S., St. Joseph; M.S., New York U.; Ed.D., Temple
- BARTOL, FRANK F., *Assistant Professor (An. & Dairy Sc.)*, 1983. B.S., Va. Tech; M.S., Ph.D., Florida
- BARTELS, JAN E., *Professor & Head (Radiology)*, 1967, 1978. B.S., Oregon State; D.V.M., Washington State; M.S., Guelph
- BAYNE, DAVID R., *Associate Professor (Fish. & Allied Aquas.)*, 1972, 1979. B.A., Tulane; M.S., Ph.D., Auburn
- BEALS, HAROLD O., *Associate Professor (Forestry)*, 1960, 1969. B.S.F., M.S., Ph.D., Purdue
- BEAMISH, JULIA O., *Assistant Professor (Consumer Affairs)*, 1983. B.S., E. Carolina; M.Ed., UNC-Greensboro; Ph.D., Va. Tech
- BEARD, ATHA, *Assistant Professor (Acct. & Finance)*, 1965, 1969. B.S., M.B.A., Auburn
- BEAUDOIN, ROBERT E., *Assistant Professor (Mathematics)*, 1984. B.A., Clemson; A.M., Ph.D., Dartmouth
- BECK, DIANE E., *Assistant Professor (Clinical Pharm.)*, 1979. B.S., Pharm. D., Florida
- BECKETT, ROYCE E., *Professor (Mech. Engr.)*, 1977. B.S., M.E., M.S., Illinois; Sc.D., Washington (St. Louis)
- BECKETT, S. DWAYNE, *Associate Dean (Vet. Med.)*, 1966, 1981. B.S., Miss. State; D.V.M., M.S., Auburn; Ph.D., Missouri
- BECKWITH, GUY V., *Assistant Professor (History)*, 1978, 1980. B.A., M.A., Ph.D., California
- BECKWITH, WILLIAM H., *Business Manager of Athletics*, 1951, 1972. B.S., Auburn
- BEDEIAN, ARTHUR G., *E.L. Lowder Professor (Management)*, 1974, 1982. B.B.A., Iowa; M.B.A., Memphis State; D.B.A., Miss. State
- BELL, C. LEARY, *Adj. Asst. Professor (Mathematics)*, 1984. B.S., Ga. SW; M.S., Ph.D., Auburn
- BELL, LANSFORD C., *Associate Professor (Civil Engr.)*, 1973, 1979. B.S., M.S., Maryland; Ph.D., Vanderbilt
- BELL, SIDNEY C., *Professor (Ag. Ec. & Rural Soc.)*, 1956, 1971. B.S., M.S., Auburn; Ph.D., Michigan State; J.D., Jones Law Institute
- BELLANTE, DON M., *Professor (Economics)*, 1970, 1981. B.S., Bryant; M.B.A., Washington; Ph.D., FSU

- BELSER, THOMAS A., JR., *Professor (History)*, 1957, 1968. B.A., M.A., Ph.D., Vanderbilt
- BENEFIELD, LARRY D., *Alumni Associate Professor (Civil Engr.)*, 1979. B.S.C.E., M.S.C.E., Auburn; Ph.D., Va. Tech
- BENGTSON, EDWIN J., *Assistant Professor (HPR)*, 1970. B.S., M.S., Springfield
- BENNETT, DONNA V., *Research Associate & Instructor (Mathematics)*, 1977, 1978. B.A., Vanderbilt
- BENNETT, ROY E., *Associate Professor (Music)*, 1978. B.M.Ed., Stetson; M.M., D.M.A., LSU
- BENSON, PHILIP G., *Assistant Professor (Psychology)*, 1980, 1982. B.S., M.S., Ph.D., Colorado State
- BENTLEY, MARY E., *Adj. Instructor (Found. of Ed.)*, 1976, 1980. B.S., M.A.C.T., M.Ed., Auburn
- BERGER, BRUCE A., *Associate Professor (Phar. Care Syst.)*, 1982, 1984. B.S., M.S., Ph.D., Ohio State
- BERGER, ROBERT S., *Professor (Zoo-Entomol.)*, 1963, 1970. B.S., M.S., Texas A&M; Ph.D., Cornell
- BERNARD, NANCY M., *Asst. Coord., Placement, Career Dev. Svc.*, 1982, 1984. B.S., M.Ed., Auburn
- BIBLIS, EVANGELOS J., *Professor (Forestry)*, 1965, 1973. B.F., Thessaloniki; M.F., D.F., Yale
- BIGGER, ALVIN J., *Instructor (Mathematics)*, 1984. B.S., M.Ed., Auburn
- BISARO, DAVID M., *Assistant Professor (Bot. & Microbiol.)*, 1983. B.S., Ph.D., Wayne State
- BITTNER, ENID, *Assistant Professor (Geology)*, 1982, 1983. B.S., F.I. Lewis, Ph.D., Idaho
- BIZZIGOTTI, GEORGE, *Assistant Professor (Chemistry)*, 1984. A.B., Ph.D., Rutgers
- BLACK, JOHN B., *Ext. Program Associate (Rehab. & Sp. Ed.)*, 1980. B.A., Clemson; M.A., Appalachian State; Ph.D., Idaho
- BLACK, J. T., *Professor (Ind. Engr.)*, 1984. B.S.I.E., Lehigh; M.S.I.E., W. Virginia; Ph.D., Illinois
- BLACKWELL, GAINES T., *Professor (Architecture)*, 1974, 1974. B.A., Alabama; M.F.A., Georgia
- BLAGBURN, BYRON L., *Assistant Professor (Path. & Parasit.)*, 1982. B.S., M.S., Andrews; Ph.D., Illinois
- BLAKE, BRUCE D., *Academic Adviser (Arts & Sciences)*, 1946, 1982. B.A., Auburn
- BLAKE, JOHN R., *Accountant, Gen. Fin. & Acct.*, 1983. B.S., Auburn
- BLAKENEY, LARRY C., *Assistant Football Coach, Athletic Department*, 1977. B.S., Auburn
- BLAKENEY, WILLIAM G. G., *Associate Professor (Ind. Engr.)*, 1958, 1961. B.S., Nova Scotia Tech.; M.Sc., Ohio State
- BLESSING, DANIEL L., *Assistant Professor (HPR)*, 1980. B.A., St. Leo; M.A., Alabama
- BLEVINS, WILLARD T., *Associate Professor (Botany, Plant Path. & Microb.)*, 1973, 1978. B.S., Appalachian; M.S., Ph.D., N. Carolina State
- BLOCK, DENNIS H., *Assistant Director, Water Resources Research Institute*, 1984. B.S., Morningside
- BLUMENFELD, HARRY B., *Instructor (Acct. & Fin.)*, 1982. B.B.A., C.C.N.Y., M.A., New York
- BOBO, FREDDY R., *Auditor II*, 1981. B.S., Jax State; M.P.A., Auburn-Montgomery
- BODDIE, GERALDINE, *Clinical Supervisor (Comm. Disorders)*, 1983, 1984. B.S., Mercer; M.C.D., Auburn
- BOGARD, DOLORES, *Assistant Professor (Art)*, 1978, 1984. B.A., Texas; M.A., Ph.D., New Mexico
- BOHANAN, DONNA J., *Assistant Professor (History)*, 1982. B.S., Hendrix; M.A., Ph.D., Emory
- BOHMANN, CHARLES F., *Admin. Assistant, Drake S.H.C.*, 1973. B.S., New York
- BOJARSKI, ANN C., *Associate Professor, OPSR*, 1984. B.S., Auburn; M.P.A., AUM
- BOLAND, JOSEPH S., III, *Professor (Elec. Engr.) & Engr. Admin. & Assistant Dean*, 1961, 1983. B.E.E., M.S., Auburn; Ph.D., Ga. Tech
- BOND, EVELYN BRANCH, *Assistant Professor (Voc. & Adult Ed.)*, 1965, 1968. B.S., Berry; M.Ed., Auburn
- BOND, GORDON C., *Professor (History)*, 1967, 1982. B.S., M.A., Ph.D., FSU
- BONE, LEON W., *Adj. Assoc. Professor (Path. & Parasit.)*, 1982. B.S., M.S., Memphis State; Ph.D., Arkansas
- BOOSINGER, TIMOTHY R., *Assistant Professor (Path. & Parasit.)*, 1983. D.V.M., Ph.D., Purdue
- BORN, CHARLES K., *Associate Professor (Pharmaceutical Sciences)*, 1972. B.S., Arkansas; M.S., Ph.D., Purdue
- BOTTJER, KURT P., *Adj. Asst. Professor (Path. & Parasit.)*, 1982. M.A., Cal-Davis; B.S. & Ph.D., Notre Dame
- BOUNDS, JIMMIE L., *Academic Adviser (Nursing)*, 1972, 1979. B.S., Montevallo; M.R.E., SW Baptist Theological Seminary
- BOWMAN, GEORGE R., *Instructor (Music)*, 1981. B.Mus., B.A., Ga. State; M.Mus., Tennessee; D. Mus., FSU
- BOWERS, FRANKLIN T., *Mgr., Anal. Inst. (Chemistry)*, 1977, 1979
- BOYD, CLAUDE E., *Professor (Fish. & Allied Aqua.)*, 1971, 1977. B.S., M.S., Miss. State; Ph.D., Auburn
- BOYETT, JOSEPH E., JR., *Assistant Professor (Management)*, 1981. B.S.F., Georgia; M.S., D.B.A., Colorado
- BOYLES, WILEY R., *Professor (Management)*, 1970, 1984. B.S., Chattanooga; Ph.D., Tennessee
- BRACKIN, H. GLENN, *Broadcast Media Op. Manager, Ed. TV*, 1960, 1968. B.S., Auburn
- BRACKIN, PATRICIA L., *Bus. Mgr. (Alumni Office)*, 1956, 1975
- BRADBARD, DAVID E., *Assistant Professor (Management)*, 1978. B.S., M.S., New Hampshire; Ed.D., Georgia
- BRADBARD, MARILYN R., *Associate Professor & Head (Fam. and Child Dev.)*, 1978, 1984. B.S., New Hampshire; M.S., Ph.D., Georgia
- BRADLEY, BERT E., *Professor & Head (Speech Comm.)*, 1973. A.B., Birmingham-Southern; M.A., Alabama; Ph.D., FSU
- BRADLEY, JAMES T., *Associate Professor (Zoo-Entomol.)*, 1976. B.S., Wisconsin; Ph.D., Washington
- BRALY, DAVID K., *Visit. Instructor (Architecture)*, 1984. B.S., B.Arch., Auburn
- BRAMLET, ANNA MARIE E., *Auditor I, Internal Auditing*, 1984. B.S., Auburn
- BRANCH, CHARLES E., *Associate Professor (Phys. & Pharma.)*, 1970, 1981. B.M.E., Ph.D., Auburn
- BRANDT, PAUL C. H., *Professor and Head (Building Science)*, 1968. B.S., M.S., Illinois
- BRANDT, WARREN W., *Vice President, Academic Affairs*, 1984. B.S., Michigan State; Ph.D., Illinois
- BRAUND, KYLE G., *Professor (Scott-Ritchey Res. Program)*, 1974, 1984. B.V.Sc., M.V.Sc., Ph.D., Sydney; F.R.C.V.S., London
- BRAWNER, WILLIAM R., JR., *Assistant Professor (Radiology)*, 1975, 1980. B.S., M.S., Florida; D.V.M., Ph.D., Auburn
- BREWER, CONRAD W., *Assistant Professor (Forestry)*, 1978. B.S.F., M.S., Georgia; Ph.D., LSU
- BREWER, ROBERT N., *Professor (Poultry Science)*, 1968, 1981. B.S., M.S., Auburn; Ph.D., Georgia
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- HINTON, MARJORIE J., *Associate Professor Emerita, Family & Child Development, June, 1984. B.S., Alabama; M.S., Auburn*
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- HOCKING, GEORGE M., *Professor Emeritus, Pharmacy, September, 1975. B.S.P., Washington; M.S.P., Ph.D., Florida*
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- HOERLEIN, BENJAMIN F., *Professor Emeritus, Small Animal Surgery & Medicine & Director Emeritus, Scott-Ritchey Research Program, July, 1984. B.V.M., Colorado State; Ph.D., Cornell*
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- JOHNSON, W. A., *Associate Professor Emeritus, Horticulture, January, 1975. B.S., M.S., Auburn*
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- LORENDO, JANE C., *Associate Professor Emerita, Consumer Affairs, June, 1983. B.S., Minnesota; M.S., Auburn*
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- PUNKE, HAROLD H., *Professor Emeritus, Foundations of Ed., June, 1971. B.S., M.S., Illinois; Ph.D., Chicago*
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- ROBINSON, A. JUDE, *Associate Professor Emeritus, Mathematics, June, 1967. B.S., Clemson; M.A., Emory*
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- SCARBOROUGH, C. CAYCE, *Professor Emeritus, Vocational & Adult Education*, September, 1979. B.S., M.S., Auburn; Ed.D., Illinois
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- SCARSBROOK, CLARENCE E., *Professor Emeritus, Agronomy and Soils*, October, 1978. B.S., Auburn; Ph.D., N. Carolina State
- SCHELL, FRED G., *Professor Emeritus, L. An. Surg. and Med.*, February, 1974. D.V.M., Auburn
- SELF, RAYMOND L., *Professor Emeritus, Plant Pathology*, April, 1981. B.S., M.S., Auburn; Ph.D., Wisconsin
- SHERLING, WILLIAM G., *Associate Professor Emeritus, Aero. Engr.*, October, 1980. B.A.E., Auburn; M.S.A.E., Georgia Tech
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- SNOW, SAMUEL P., *Professor Emeritus, Architecture*, September, 1981. B.S., B.L.A., M.S., Massachusetts; M.L.A., Harvard
- SPANN, RANSOM D., *Professor Emeritus, Electrical Engr.*, June, 1964. B.S.E.E., E.E., Auburn
- SPEER, WILLIAM A., *Professor Emeritus, Architecture*, June, 1980. B.S. Arch, Clemson, M.Arch., Rensselaer Tech
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- STROUD, OXFORD, *Associate Professor Emeritus, English*, September, 1983. B.S., M.A., Auburn
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- THOMPSON, SIDNEY LEE, *Associate Professor Emeritus, Mathematics*, June, 1976. B.S., Birmingham-Southern; M.S., Tulane; M.A., Michigan
- TRUCKS, LOUIS B., *Associate Professor Emeritus, Industrial Engineering*, January 1983. B.S., Auburn; M.S., Pittsburgh; Ph.D., Oklahoma State
- TUCKER, HOWARD F., *Associate Professor Emeritus, An. & Dairy Sc.*, October, 1981. B.S., M.S., Ph.D., Auburn
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- TURNER, DEWEY M., *Associate Professor Emeritus, An. and Dairy Sc.*, December, 1972. B.S., Auburn; M.S., Illinois
- UMBACH, A. W., *Professor and Wrestling Coach Emeritus*, August, 1973. B.S., SW State Teachers; M.A., Colorado State Education
- VALLERY, GEORGIA G., *Associate Professor Emerita, Psychology*, September, 1982. B.S., M.A., LSU; M.S., Auburn
- VALLERY, H. F., *Assistant to the President Emeritus*, July, 1979. B.A., M.A., LSU; M.A., Ed.D., Columbia
- VANDEGRIFT, FRANK, *Director Emeritus, Cooperative Education*, January, 1985. B.M.E., Georgia Tech; M.A., Columbia Theological Seminary
- VAN DE MARK, MILDRED S., *Professor Emerita, Home Economics*, March, 1973. B.S., Auburn; M.S., Columbia
- WALKIN, JACOB, *Professor Emeritus, Political Science*, September, 1982. A.B., Cornell; M.A., Yale; Ph.D., California
- WARD, BENJAMIN P., *Associate Professor Emeritus, Mech. Engr.*, July, 1968. B.S., U.S. Naval Academy; M.S.M.E., Columbia
- WARREN, W. M., *Professor Emeritus, An. and Dairy Sc.*, September, 1980. B.S., Michigan State; M.S., Texas A&M; Ph.D., Missouri
- WHEATLEY, WALTER B., *Associate Professor Emeritus, Chemiatry*, June, 1982. B.S., Birmingham-Southern; M.T. (ASCP), Lloyd Noland Foundation; M.S., Auburn
- WHITE, MORRIS, *Professor Emeritus, Agricultural Economics & Rural Sociology*, January, 1983. B.S., Auburn; M.S., Ph.D., Purdue
- WHITE, RAYMOND H., *Professor Emeritus, Education*, April, 1965. B.S., SW Missouri; A.B., Drury; A.M., Chicago; Ed.D., Columbia
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- WILLIAMS, BYRON B., JR., *Professor Emeritus, Pharmacology-Toxicology*, August, 1981. B.S., M.S., Ph.D., Florida
- WILLIAMS, ERNEST, *Professor Emeritus, Mathematics*, June, 1976. B.S., Birmingham-Southern; M.S., Auburn; Ph.D., Michigan
- WILLIAMSON, EDWARD C., *Professor Emeritus, History*, June, 1983. A.B., M.A., Florida; Ph.D., Pennsylvania
- WINGARD, ROBERT EUGENE, *Professor Emeritus, Chemical Engr.*, October, 1974. B.S., M.S., Auburn
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- YOUNG, LUTHER M., *Associate Professor Emeritus, HPR*, January, 1977. B.S., M.S., Auburn
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STATE REGULATORY AND VETERINARY SERVICES

STATE REGULATORY SERVICE

CHEMISTRY

State Chemical Laboratory

JINKS, JOHN D., *Director*, 1968. B.S., Auburn
HAYES, MELVIN, *Agricultural Chemist II*, 1966, 1968. B.S., West Virginia
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OWEN, MARGIE E., *Agricultural Chemist II*, 1972. B.S., M.S., N. Alabama
CARMICHAEL, JOE G., *Agricultural Chemist I*, 1980. B.S., Troy State
DUNCAN, JUDITH, C., *Agricultural Chemist I*, 1984. B.S., Philippines, M.S., Michigan
THORNTON, ADRIAN, *Agricultural Chemist I*, 1980. B.S., Tuskegee Institute
BOULWARE, PAUL, *Chemist II*, 1970. B.S., M.S., Auburn
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MITCHELL, FRANK, *Assistant State Veterinarian & Director, State Diagnostic Laboratory*, 1977, 1963. D.V.M.,
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AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

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 JOLLY, C.M., *Assistant Professor*, 1980. B.S., Tuskegee; M.S., Auburn; Ph.D., LSU
 WILSON, L. E., *Professor*, 1960, 1968. B.S., Murray State; M.S., Kentucky; Ph.D., Illinois
 ADRIAN, JOHN L., JR., *Professor*, 1974, 1984. B.A.A., M.S., Auburn; Ph.D., Tennessee
 CLONTS, HOWARD A., JR., *Professor*, 1962, 1980. B.S., M.S., Auburn; Ph.D., Va. Tech
 DUNKELBERGER, J. E., *Professor*, 1962, 1982. A.B., Franklin and Marshall; M.S., Penn. State; Ph.D., Miss. State
 HANSON, G. D., *Assistant Professor*, 1981. B.A., Dartmouth; M.S., Ph.D., Minnesota
 HATCH, L. UPTON, *Assistant Professor*, 1982. B.A., Dartmouth; M.S. Georgia; Ph.D., Minnesota
 KINNUCAN, HENRY W., *Assistant Professor*, 1983. B.S., Illinois; M.S., Ph.D., Minnesota
 STALLINGS, JAMES L., *Associate Professor*, 1969. B.S., M.S., Purdue; Ph.D., Michigan State
 HARDY, WILLIAM E., JR., *Professor*, 1972, 1983. B.S., M.S., Ph.D., Va. Tech
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 *ADAMS, MURRAY, JR., *Associate Professor (Soc. & Anthro.)*, 1964, 1970. B.A., M.A., Mississippi; Ph.D., Kentucky
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 SULLIVAN, GREGORY M., *Assistant Professor*, 1979. B.A., Notre Dame, M.Agr., Ph.D., Texas A&M
 BARNES, T. A., *Research Associate*, 1960. B.S., Auburn
 COX, L. R., *Research Associate*, 1984. B.S., M.S., Miss. State
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AGRICULTURAL ENGINEERING

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 HILL, D. T., *Associate Professor*, 1979. B.S., M.S., Georgia; Ph.D., Clemson
 FLOOD, C. A., JR., *Associate Professor*, 1971, 1979. B.S., Florida; M.S., Kentucky; Ph.D., Purdue
 KOON, JOE L., *Associate Professor*, 1967, 1975. B.S., M.S., Ph.D., Auburn
 ROCHESTER, E. W., JR., *Associate Professor*, 1970, 1978. B.S., Clemson; M.S., Ph.D., N. Carolina State
 YOO, K. H., *Assistant Professor*, 1983. B.S., Seoul; M.S., Ph.D., Idaho
 FRIDLEY, J. L., *Assistant Professor*, 1984. B.S., Cal-Davis; M.S., Michigan State; Ph.D., Washington
 BOLTE, J. B., *Research Associate*, 1983. B.S., M.S., Florida
 JOHNSON, G. C., *Research Associate*, 1983. B.S., Tennessee
 NICHOLS, T. A., *Research Associate*, 1982. B.S., Auburn
 TICE, E. M., *Research Associate*, 1983. B.S., M.S., Penn State
 TRUMBULL, R. D., *Research Associate*, 1984. B.S., M.S., Nebraska
 WOOD, R. K., *Research Associate*, 1984. B.S., M.S., Kentucky
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 BAILEY, A. C., *Agricultural Engineer (Coop. USDA)*, 1965. B.S., Michigan State; M.S., Illinois; Ph.D., Auburn
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 HENDERICK, J. G., *Agricultural Engineer (Coop. USDA)*, 1962, 1968. B.S., M.S., Auburn; Ph.D., Michigan State
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- DICKENS, RAY, *Professor*, 1965, 1973. B.S., Arkansas; M.S., Ph.D., Auburn
- HAJEK, B. F., *Professor*, 1968, 1978. B.S., Texas A&M; Ph.D., Auburn
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ANIMAL AND DAIRY SCIENCES

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ANIMAL HEALTH RESEARCH

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BOTANY, PLANT PATHOLOGY & MICROBIOLOGY

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FORESTRY RESEARCH

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GEORGE W. ANDREWS FORESTRY SCIENCES LABORATORY, USDA SILVICULTURE RESEARCH

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HOME ECONOMICS RESEARCH

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HORTICULTURE

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POULTRY SCIENCE

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RESEARCH OPERATIONS

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ZOOLOGY-ENTOMOLOGY

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Chilton Area Horticulture—Clanton, Chilton County

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Gulf Coast—Fairhope, Baldwin County

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Lower Coastal Plain—Camden, Wilcox County

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Extension Agricultural Economics

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Agronomy

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Pest Management

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4-H AND YOUTH

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COMMUNITY RESOURCES DEVELOPMENT

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INFORMATION SERVICES

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 MARK H. HALL, *Associate County Agent*, 1978, 1983. B.S., M.S., Auburn
 LINDA E. SARTAIN, *Associate County Agent*, 1978. B.S., Ed.S., Auburn

Marion County—Hamilton

PENELOPE F. WALTON, *County Agent-Coordinator*, 1972, 1977. B.S., M.S., Alabama
 BOBBY J. WALLACE, *Assistant County Agent*, 1979, 1980. B.S., Auburn
 LISA MURPHY, *Assistant County Agent*, 1981. B.S., N. Alabama
 MICHAEL HENSHAW, *Assistant County Agent*, 1983. B.S., M.S., Kentucky

Marshall County—Guntersville

FRANKLIN H. WOOD, *County Agent-Coordinator*, 1963, 1977. B.S., M.Agr., Auburn
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 I. JANNETTE LACKEY, *County Agent*, 1985, 1977. B.S., Auburn; M.S., Tennessee
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 WILLIAM H. NICHOLS, *Assistant County Agent*, 1981. B.S., Auburn

Morgan County—Hartselle

HARRY W. HOUSTON, *County Agent-Coordinator*, 1954, 1977. B.S., M.Agr., Auburn
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 THERMA E. GOTTLER, *County Agent*, 1974, 1984. B.S., M.A.T., Montealio
 JULIE A. DUTTON, *Associate County Agent*, 1977, 1980. B.S., Tenn. Tech
 WATKINS CARTER, *County Agent*, 1967, 1984. B.S., M.S., Miss. State

Shelby County—Columbiana

LEE GRANT GOBER, *County Agent-Coordinator*, 1960, 1977. B.S., M.S., Auburn
 JOHN E. JONES, *County Agent*, 1958, 1977. B.S., Auburn
 PEGGY A. PRUCNAL, *County Agent*, 1969, 1981. B.S., M.S., Jacksonville State
 GAIL D. REAGAN, *Associate County Agent*, 1979, 1983. B.S., U. of Jacksonville; M.A., Alabama
 ANTHONY JONES, *Assistant County Agent*, 1981. B.S., Tuskegee

St. Clair County—Pell City

DOROTHY P. BRICE, *Associate County Agent*, 1970, 1979. B.S., Alabama A&M; M.A.T., Montealio
 DONNA A. MORRIS, *Assistant County Agent*, 1978, 1979. B.S., N. Alabama
 DONALD LESTER, *Associate County Agent*, 1973, 1981. B.S., M.Ed., Auburn
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Walker County—Jasper

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 SHIRLEY WHITTEN, *Assistant County Agent*, 1981. B.S., Auburn; M.S., Alabama A&M
 CHERRY CARTER, *Assistant County Agent*, 1982. B.S., Auburn

Winston County—Double Springs

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DISTRICT II
(Auburn)

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CLEO S. WALKER, *District Agent-Home Economics*, 1936, 1976. B.S., M.S., Tuskegee

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County Staffs

Barbour County—Clayton

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WILLIAM H. LINDSEY, *Associate County Agent*, 1966, 1979, B.S., Tuskegee

RUTH H. HUNTER, *Associate County Agent*, 1974, 1983. B.S., N. Alabama

MARSHA R. MOORHEAD, *Associate County Agent*, 1976. B.S., Auburn

CHARLES R. MASON, *Assistant County Agent*, 1980. B.S., M.S., Auburn

Bullock County—Union Springs

ARMSTEAD YOUNG, *Assistant County Agent*, 1973, 1976. B.S., M.S., Tuskegee

NANNIE S. RHODES, *County Agent*, 1959, 1976. B.S., Southern

DAVID G. MITCHELL, *Assistant County Agent*, 1981. B.S., Auburn

Calhoun County—Anniston

LARRY EASTERWOOD, *County Agent-Coordinator*, 1961, 1977. B.S., M.Ed., Auburn

BARBARA MOBLEY, *County Agent*, 1966, 1976. B.A., M.A., Mississippi

MAZIE WILSON, *County Agent*, 1972, 1983. B.S., Alabama A&M; M.A.T., Montevallo

BRENDA ALLEN, *Associate County Agent*, 1978, 1983. B.S., M.S., Tuskegee

RUTH G. SARRO, *Assistant County Agent*, 1980, 1982. B.S., Auburn

ROBERT MEEKS, *Assistant County Agent*, 1980. B.S., Auburn

Chambers County—LaFayette

HOWARD A. TAYLOR, *County Agent-Coordinator*, 1962, 1976. B.S., M.Ag.Ed., Auburn

ROSALIND R. JENKINS, *Assistant County Agent*, 1980. B.S., M.Ed., Tuskegee

BRENDA JONES, *Associate County Agent*, 1971, 1982. B.S., Jacksonville State M.S., Livingston

Clay County—Ashland

TOM FARROW, *County Agent Coordinator*, 1970, 1976. B.S., M.Ed., Auburn

DORA-GRACE SMITH, *County Agent*, 1952, 1976. B.S., Montevallo

Cleburne County—Heflin

ELEANOR MATHEWS, *Assistant County Agent*, 1984. B.S., Auburn

Coffee County—New Brockton

TOM C. CASADAY, *County Agent-Coordinator*, 1949, 1976. B.S., M.Ag., Ed.S., Auburn

DAN J. PRESLEY, *County Agent*, 1964, 1977. B.S., M.Ag., Ed.S., Auburn

SARA HUTCHINSON, *County Agent*, 1956, 1976. B.S., Samford; M.S., Ed.S., Auburn

ANGELA G. HUGHES, *Associate County Agent*, 1973, 1984. B.S., Alabama

Coosa County—Rockford

MARIAH BRYMER, *County Agent-Coordinator*, 1963, 1981. B.S., M.Ed., Tuskegee

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Covington County—Andalusia

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Crenshaw County—Luverne

LATHAN D. HOOKS, *County Agent-Coordinator*, 1971, 1976, 1980. B.S., M.S., Auburn
 HELEN J. SAFFOLD, *Associate County Agent*, 1977. B.S., Alabama A&M; M.S., Tenn. State
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Dale County—Ozark

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 TERESA Z. WILLIAMS, *Associate County Agent*, 1980, 1983. B.S., Montevallo. M.Ed., Auburn
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Elmore County—Wetumpka

WAYNE E. DAVIS, *County Agent-Coordinator*, 1959, 1981. B.S., M.S., Auburn
 MARILEE TANKERSLEY, *County Agent*, 1975, 1984. B.S., Auburn
 GWENDOLYN TURNER, *County Agent*, 1968, 1976. B.S., Alabama A&M
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Geneva County—Geneva

ROBERT C. REYNOLDS, *County Agent-Coordinator*, 1954, 1976. B.S., M.Ag. Ed., Auburn
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Henry County—Abbeville

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Houston County—Dothan

ALLEN M. MATHEWS, *County Agent-Coordinator*, 1957, 1976. B.S., M.Ag., Auburn
 REAFIELD VESTER, *County Agent*, 1966, 1979. B.S., Alabama A&M; M.S., Florida
 CLAUDIA MEADOWS, *County Agent*, 1971, 1984. B.S., Auburn
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 PATSY M. WHITE, *County Agent*, 1970, 1977, 1980. B.S., M.S., Troy State
 C. LAMAR NICHOLS, *Assistant County Agent*, 1982. B.S., W. Kentucky
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Lee County—Opelika

JEFFREY CLARY, *County Agent-Coordinator*, 1973, 1977. B.S., M.Ed., Auburn
 ANNE B. CHURCH, *Associate County Agent*, 1982. B.S., M.S., Auburn
 MATTIE WALKER, *Associate County Agent*, 1974, 1983. B.S., Alabama A&M
 BOBBY G. SPEARS, *Associate County Agent*, 1977, 1983. B.S., M.Ag., Auburn

Macon County—Tuskegee

ELMER DOWDELL, *County Agent-Coordinator*, 1957, 1977. B.S., Alcorn A&M; M.S., Tuskegee
 ANNETTE B. WALLACE, *County Agent*, 1966, 1979. B.S., M.S., Alabama A&M
 RASSIE T. FARMER, *County Agent*, 1967, 1982. B.S., Langston; M.Ed., Tuskegee

Montgomery County—Montgomery

ADDRE BRYANT, *County Agent-Coordinator*, 1954, 1977. B.S., M.S., Tuskegee
 BOBBY L. HANKS, *County Agent*, 1974, 1984. B.S., M.S., Auburn
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LARRY J. CRAFT, *Assistant County Agent*, 1980. B.S., Auburn
 JANICE K. JARRETT, *Assistant County Agent*, 1980. B.S., N. Alabama

Pike County—Troy

TED B. SMITH, *County Agent-Coordinator*, 1963, 1983. B.S., Auburn; M.S., Troy State
 DAVID B. CARPENTER, *Associate County Agent*, 1975, 1976. B.S., Auburn
 DENA L. BARNES, *Associate County Agent*, 1973, 1976. B.S., M.Ed., Auburn
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Randolph County—Wedowee

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 ELAINE E. NELSON, *County Agent*, 1969, 1976. B.S., Jacksonville State
 CHRISTINE B. BAILEY, *Associate County Agent*, 1978. B.S., N. Alabama
 RUSSELL PARRISH, *Assistant County Agent*, 1983. B.S., Auburn

Russell County—Phenix City

BETTY H. WILSON, *County Agent-Coordinator*, 1971, 1983. B.S., Montevallo; M.Ed., Auburn
 DONALD BICE, *Associate County Agent*, 1970, 1977. B.S., Auburn
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Talladega County—Talladega

MARIE H. PLAYER, *County Agent-Coordinator*, 1957, 1976. B.S., Alabama A&M; M. Ed., Tuskegee
 JAKE B. MATHEWS, *County Agent*, 1949, 1977. B.S., Auburn
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 AUSTIN WILLIAMS, *Assistant County Agent*, 1980. B.S., Auburn
 SUSAN FOSTER WINGARD, *Associate County Agent*, 1980, 1984. B.S., N. Alabama

Tallapoosa County—Dadeville

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 MELINDA LUKER, *Associate County Agent*, 1978, 1983. B.S., M.S., Auburn

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Autauga County—Prattville

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 JEFFERY MOORE, *Assistant County Agent*, 1980. B.S., Tuskegee
 JEFFERY THOMPSON, *Assistant County Agent (Pest Mgt.)*, 1980. B.S., Auburn
 JUDITH F. BROWN, *County Agent*, 1970, 1977. B.S., M.Ed., Auburn
 SUSAN ANN McCONNEL, *Associate County Agent*, 1975, 1977. B.S., M.A.T., Montevallo

Baldwin County—Bay Minette

LYNDELL ED TUNNELL, *County Agent-Coordinator*, 1973, 1984. B.S., M.Ed., Auburn
 DONALD EUGENE DUNN, *County Agent*, 1962, 1979. B.S., Auburn
 GRACE KIRKMAN, *Associate County Agent*, 1975, 1976. B.S., Alabama
 JOYCE M. STAUDT, *County Agent*, 1970, 1980. B.S., N. Alabama; M.S., Alabama
 ELLIS STICH, *Assistant County Agent*, 1983. B.S., Auburn

Bibb County—Centreville

MACON TIDWELL, *County Agent-Coordinator*, 1957, 1981. B.S., M.Ag., Auburn
 FAYE B. SMITH, *County Agent*, 1964, 1984. B.S., Alabama

Butler County—Greenville

DENNIS PETERSON, *Associate County Agent-Coordinator*, 1973, 1983. B.S., M.S., Auburn
 JAMES R. WILLIAMS, *Assistant County Agent*, 1980. B.S., Auburn
 LINDA LUMAN, *Assistant County Agent*, 1982. B.S., Auburn; M.S., FSU
 CAROL BRANNON, *Associate County Agent*, 1983. B.S., Alabama; M.S., N. Alabama

Chilton County—Clanton

JAMES CASH HOWELL, *County Agent-Coordinator*, 1961, 1977. B.S., M.Ag.Ed., Auburn
 TOMMY J. BROWN, *County Agent*, 1971, 1983. B.S., M.S., Auburn
 DANIEL R. MIMS, *County Agent*, 1953, 1976. B.S., Auburn
 SARAH HICKMAN McDOWELL, *County Agent*, 1967, 1977. B.S., Montevallo
 CALLIE A. NELSON, *Assistant County Agent*, 1983. B.S., Alabama A&M

Choctaw County—Butler

R.B. DEAVOURS, *County Agent-Coordinator*, 1946, 1977. B.S., Auburn; M.S., Miss. State
 GRACE M. PRINCE, *County Agent*, 1951, 1976. B.S., Auburn
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Clarke County—Grove Hill

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 LAVERNE BLOUNT, *Associate County Agent*, 1983. B.S., M.S., Alabama A&M

Conecuh County—Evergreen

HAZEL H. HARPE, *County Agent*, 1961, 1979. B.A., Judson
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Dallas County—Selma

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Escambia County—Brewton

EDWARD M. KNOWLES, *County Agent-Coordinator*, 1953, 1976. B.S., M.Ag., Auburn
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 PEGGY G. BRACKEN, *County Agent*, 1963, 1976. B.S., Auburn
 CAROLYN F. BIVINS, *Associate County Agent*, 1974, 1984. B.S., Tuskegee

Greene County—Eutaw

JERRY B. CLARK, *County Agent-Coordinator*, 1965, 1977. B.S., M.Ed., Auburn; Ed.S., Miss. State
 CHERYL B. KING, *Assistant County Agent*, 1983. B.S., Southern
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Hale County—Greensboro

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 EVELYN D. EDWARDS, *County Agent*, 1966, 1976. B.S., M.S., Alabama
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Lowndes County—Hayneville

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 OSCAR WIGGINS, *Assistant County Agent*, 1983. B.S., Auburn
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Marengo County—Linden

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 ROSALYN KETCHUM PALMER, *County Agent*, 1960, 1976. B.S., Auburn
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Mobile County—Mobile

CHARLES H. KILPATRICK, *County Agent-Coordinator*, 1964, 1979. B.S., Auburn; M.A., S. Alabama
 ANDREW D. GREER, *Associate County Agent*, 1973, 1980. B.S., Auburn; M.S., South Alabama
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Monroe County—Monroeville

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 GLORIA R. MUSSON, *Assistant County Agent*, 1983. B.S., Auburn

Perry County—Marion

RICHARD E. SMITH, *County Agent-Coordinator*, 1962, 1983. B.S., Alabama A&M; M.Ed., Tuskegee
 JOYCE N. RICHARDSON, *County Agent*, 1958, 1979. B.S., Judson
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Pickens County—Carrollton

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Sumter County—Livingston

BOB. G. SPEARS, *County Agent-Coordinator*, 1964, 1981. B.S., Oklahoma State; M.S., Tennessee
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Tuscaloosa County—Tuscaloosa

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Engineering Experiment Station Staff

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Dual roles are performed by faculty and staff of the School of Engineering who serve also as personnel of the Engineering Experiment Station.

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LUELLEN NAGLE, B.S.Ed., *Administrative Assistant, Birmingham Office*

Dual roles are performed by faculty and staff of the School of Engineering who serve also as personnel of the Engineering Extension Service.

Enrollment Statistics

Table I — Enrollment by Curriculum

Fall Quarter, 1984

AGRICULTURE AND BIOLOGICAL SCIENCES

Curriculum	Undergraduate		Graduate		Total
	Male	Female	Male	Female	
Agric. Economics & Rural Soc. (AEC)	81	11	19	2	113
Agricultural Engineering (AN)	30	2	14	—	46
Agricultural Science (AG)	20	3	—	—	23
Agriculture Journalism (AJ)	2	1	—	—	3
Agronomy & Soils (AY)	36	3	31	4	74
Animal & Dairy Sciences (ADS)	149	65	15	8	237
Botany (BY)	2	—	—	—	2
Botany & Microbiology (BY)	—	—	12	8	20
Entomology (ENT)	5	5	—	—	10
Fisheries & Allied Aqua. (FAA)	18	1	83	21	123
Horticulture (HF)	5	4	7	—	16
Microbiology (MB)	16	30	—	—	46
Marine Biology (MRB)	25	7	—	—	32
Landscape & Ornamental Horticulture (OH)	35	18	—	—	53
Poultry Science (PH)	15	2	8	2	27
Plant Protection (PLP)	3	—	—	—	3
Wildlife Management (WL)	46	15	11	3	75
Zoology (ZY)	12	34	—	—	46
Zoology-Entomology (ZY)	—	—	26	12	38
TOTAL (Agriculture)	500	201	226	60	987

ARCHITECTURE AND FINE ARTS

Architecture (AR)	312	88	—	—	400
Art (AT)	—	—	1	—	1
Building Science (BSC)	139	7	—	—	146
Community Planning (CP)	—	—	1	1	2
Industrial Design (IND)	111	23	—	—	134
Interior Design (ID)	12	73	—	—	85
Landscape Architecture (LA)	38	12	—	—	50
Music (MU)	20	22	2	1	45
Pre-Architecture (PAR)	74	15	—	—	89
Pre-Building Science (PBSC)	243	11	—	—	254
Pre-Interior Design (PID)	2	14	—	—	16
Pre-Landscape Architecture (PLA)	—	—	—	—	—
Theatre (TH)	16	19	—	—	35
Visual Arts (VAT)	127	189	—	—	316
TOTAL (Architecture & Fine Arts)	1,094	473	4	2	1,573

ARTS AND SCIENCES

Curriculum	Undergraduate		Graduate		Total
	Male	Female	Male	Female	
Applied Mathematics (AMH)	47	18	—	—	65
Applied Physics (APS)	14	—	—	—	14
Chemistry (CH)	26	15	46	16	103
Communication Disorders (CD)	1	15	1	22	39
Comparative Literature (GCL)	1	1	—	—	2
Criminal Justice (CJ)	67	38	—	—	105
Criminology (SCR)	17	24	—	—	41
English (EH)	—	—	10	33	43
Foreign Language - International					
Trade (FLT)	39	118	—	—	157
French (FLF)	—	—	4	8	12
Spanish (FLS)	—	—	3	7	10
General Curriculum - Undeclared (GC)	906	615	—	—	1,521
General Curriculum - Anthropology					
(GAN)	1	5	—	—	6
General Curriculum - Art (GAT)	2	4	—	—	6
General Curriculum - Biological					
Science (GBI)	29	20	—	—	49
General Curriculum - Chemistry (GCH)	5	6	—	—	11
General Curriculum - Earth Science					
(GGE)	2	—	—	—	2
General Curriculum - Economics (GEC)	26	5	—	—	31
General Curriculum - English (GEH)	18	42	—	—	60
General Curriculum - Foreign Language					
(GFL)	4	14	—	—	18
General Curriculum - Geography (GGY)	9	1	—	—	10
General Curriculum - History (GHY)	55	24	—	—	79
General Curriculum - Journalism (GJM)	49	84	—	—	133
General Curriculum - Mathematics					
(GMH)	34	22	—	—	56
General Curriculum - Philosophy (GPA)	6	4	—	—	10
General Curriculum - Psychology (GPG)	49	120	—	—	169
General Curriculum - Political Science					
(GPO)	71	24	—	—	95
General Curriculum - Physics (GPS)	5	—	—	—	5
General Curriculum - Religion (GRL)	6	3	—	—	9
General Curriculum - Speech (GSC)	64	121	—	—	185
General Curriculum - Social Work (GSW)	8	51	—	—	59
General Curriculum - Sociology (GSY)	3	9	—	—	12
General Curriculum - Theatre (GTH)	—	3	—	—	3
Geology (GL)	45	4	16	2	67
Health Administration (HA)	45	71	—	—	116
History (HY)	—	—	32	10	42
Lab Technology (LT)	9	27	—	—	36
Mathematics (MH)	8	4	26	10	48
Medical Technology (MDT)	9	36	—	—	45
Physics (PS)	27	10	26	7	70
Political Science (PO)	—	—	7	3	10
Pre-Dentistry (PD)	34	13	—	—	47
Pre-Law (PL)	136	78	—	—	214
Pre-Medicine (PM)	192	117	—	—	309
Pre-Occupational Therapy (OT)	1	8	—	—	9
Pre-Optometry (OP)	5	3	—	—	8
Pre-Pharmacy (PPY)	76	129	—	—	205
Pre-Physical Therapy (PT)	13	43	—	—	56
Pre-Veterinary Medicine (PV)	73	71	—	—	144
Psychology (PG)	—	—	39	52	91
Public Administration (PUB)	48	37	—	—	85
Public Relations - Journalism (PRJ)	18	58	—	—	76
Public Relations - Speech					
Communication (PRS)	46	172	—	—	218
Speech Communication (SC)	—	—	8	18	26
TOTAL (Arts & Sciences)	2,349	2,287	218	188	5,042

BUSINESS

Curriculum	Undergraduate		Graduate		Total
	Male	Female	Male	Female	
Accounting (AC)	156	130	—	—	286
Business Administration (BA)	10	3	28	20	61
Economics (EC)	13	5	21	5	44
Finance (FI)	125	67	—	—	192
General Business Theatre (GBT)	—	4	—	—	4
Industrial Operations Management (IOM)	96	19	—	—	115
International Business (IB)	49	89	—	—	138
Management (MN)	75	38	14	10	137
Marketing (MK)	48	55	—	—	103
Organizational Management (OMN)	10	8	—	—	18
Personnel Management and Industrial Relations (PIR)	27	31	—	—	58
Pre-Business (PB)	1,164	750	—	—	1,914
Transportation (TN)	13	11	—	—	24
TOTAL (Business)	1,786	1,210	63	35	3,094

EDUCATION

Adult Education (VAD)	48	5	2	2	57
Agricultural Education (VAG)	34	1	9	—	44
Art Education (CNA)	—	8	—	—	8
Basic Vocational Education (VBV)	—	—	—	—	—
Behavior Disturbance Education (RSB)	1	29	—	—	30
Business Education (VBU)	—	20	—	5	25
Community Agency Counseling (CCA)	—	—	2	14	16
Community College (ACC)	—	—	—	—	—
Counseling Psychology (COP)	—	—	3	7	10
Counselor Education (CED)	—	—	27	43	70
Curriculum Instruction (ACI)	—	—	4	10	14
Curriculum Supervision (ASC)	—	—	2	1	3
Distributive Education (VDE)	24	6	2	—	32
Early Childhood Education (CEC)	3	234	1	16	254
Early Childhood Education for the Handicapped (RSC)	—	—	—	—	—
Educational Leadership (AED)	—	—	10	4	14
Elementary Education (CEE)	5	238	—	32	275
Elementary/Secondary Admin. (AES)	—	—	18	21	39
Field Laboratory (EX)	—	—	6	3	9
General Education (GED)	4	8	—	—	12
Gifted Education (RSG)	—	—	—	2	2
Health Education (HHE)	3	3	2	2	10
Health Occupations (VHO)	1	—	—	—	1
Health & Physical Education (HPE)	60	65	5	9	139
Health, Physical Education, and Recreation (HPR)	18	1	10	7	36
Higher Education Administration (AHE)	—	—	25	23	48
Home Economics Education (VHE)	—	18	—	8	26
Industrial Arts Education (VIA)	12	—	—	—	12
Learning Disabilities (RSL)	—	—	—	2	2
Media — Instructional Development (MID)	—	—	—	8	8
Media Specialist (MSE)	—	—	1	11	12
Mental Retardation Education (RSM)	1	30	2	4	37
Middle School - English/Language Arts (CME)	—	—	—	—	—
Middle School - Mathematics (CMN)	—	—	—	—	—
Middle School - Social Science (CMS)	—	1	—	—	1
Music Education (CNM)	24	33	2	3	62
Office Administration (VOA)	—	64	—	—	64
Public School Counseling (CPS)	—	—	—	2	2
Reading Education (CNR)	—	—	—	3	3
Recreation Administration (HRA)	18	16	—	—	34
Rehabilitation & Special Education (RSE)	1	7	8	17	33
Rehabilitation Counseling (CRC)	—	—	3	11	14
Rehabilitation Service Education (RSR)	3	39	3	9	54
Secondary School - English (CSE)	9	42	8	18	77
Secondary School - Foreign Language (CSF)	1	7	—	—	8
Secondary School - Mathematics (CSM)	22	68	3	7	100
Secondary School - Physical Education (HPS)	35	20	—	—	55
Secondary School - Science (CSC)	14	42	6	5	67
Secondary School - Social Science (CSS)	13	20	4	6	43

Curriculum	Undergraduate		Graduate		Total
	Male	Female	Male	Female	
Speech Pathology Education (RSS)	1	98	—	—	99
Speech/Theatre Education (CNS)	—	—	—	—	—
Student Development (CSD)	—	—	2	7	9
Trade & Industrial Education (VTI)	—	—	1	—	1
Vocational & Adult Education (VED)	—	—	26	15	41
TOTAL (Education)	355	1,123	197	337	2,012

ENGINEERING

Aerospace Engineering (AE)	174	15	12	—	201
Aviation Management (AM)	92	7	—	—	99
Chemical Engineering (CHE)	129	39	57	4	229
Civil Engineering (CE)	157	16	34	1	208
Computer Science & Engineering (CS) (CPE)	212	98	16	5	331
Electrical Engineering (EE)	675	84	52	2	813
Industrial Engineering (IE)	98	71	24	7	200
Materials Engineering (MTL)	14	3	—	—	17
Mechanical Engineering (ME)	349	26	35	7	417
Pre-Chemical Engineering (PCN)	60	35	—	—	95
Pre-Engineering (PN)	1,412	339	—	—	1,751
Pre-Engineering - Management (PMN)	60	4	—	—	64
Pre-Engineering - Textiles (PTN)	37	15	—	—	52
Textile Chemistry (TC)	4	5	—	—	9
Textile Engineering (TE)	5	6	—	—	11
Textile Management & Technology (TMT)	17	6	—	—	23
TOTAL (Engineering)	3,495	769	230	26	4,520

FORESTRY

Forest Products (FP)	3	—	—	—	3
Forestry (FY)	72	10	29	—	111
Forest Engineering (FYE)	21	2	—	—	23
TOTAL (Forestry)	96	12	29	—	137

HOME ECONOMICS

Clothing and Textiles (CT)	3	21	—	—	24
Consumer Affairs (CA)	—	—	—	8	8
Consumer & Family Economics (CFE)	1	12	—	—	13
Dietetics (CDP)	—	25	—	—	25
Family & Child Development (FCD)	5	50	4	18	77
Family & Child Services (FCS)	—	7	—	—	7
Family Resources Management (FRM)	—	14	—	—	14
Fashion Merchandising (FM)	4	159	—	—	163
Food Service Administration (FSA)	3	6	—	—	9
Food Science	5	5	—	—	10
Housing & Equipment (HEQ)	—	1	—	—	1
Interior Furnishings & Equipment (IFE)	1	57	—	—	58
Nutrition & Foods (NF)	3	62	2	11	78
TOTAL (Home Economics)	25	419	6	37	487

NURSING

Nursing (NUR)	2	101	—	—	103
Pre-Nursing (NS)	12	175	—	—	187
TOTAL (Nursing)	14	276	—	—	290

PHARMACY

Curriculum	Undergraduate		Graduate		Total
	Male	Female	Male	Female	
Doctor of Pharmacy Option (PYD)	4	2	—	—	6
Pharmacy (PY)	84	112	6	5	207
Pharmacy Care Systems (PCS)	—	—	3	2	5
TOTAL (Pharmacy)	88	114	9	7	218

VETERINARY MEDICINE

Large Animal Surgery & Medicine (VLA)	—	—	3	—	3
Pathology & Parasitology (VPP)	—	—	3	1	4
Physiology & Pharmacology (VPH)	—	—	3	2	5
Small Animal Surgery & Medicine (VSA)	—	—	4	2	6
Veterinary Microbiology (VMI)	—	—	8	6	14
Veterinary Medicine (VM)	251	138	5	8	402
TOTAL (Veterinary Medicine)	251	138	26	19	434

INTERDEPARTMENTAL PROGRAMS

Environmental Health (ENH)	3	1	—	—	4
Nutrition (NN)	—	—	1	1	2
Physiology (IP)	—	—	9	3	12
Sociology (SY)	—	—	2	4	6
TOTAL (Interdepartmental)	3	1	12	8	24

TRANSIENTS AND AUDITORS

Transients & Auditors (TR)	36	24	4	6	70
TOTAL (Transients & Auditors)	36	24	4	6	70

ALL UNIVERSITY

GRAND TOTAL	10,092	7,047	1,024	725	18,888
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SUMMARY BY CLASS LEVEL

Freshmen	2,614	1,988	—	—	4,602
Sophomores	2,493	1,662	—	—	4,155
Juniors	2,189	1,613	—	—	3,802
Seniors	2,522	1,619	—	—	4,141
Fifth Year	153	80	—	—	233
Other Undergraduates	121	85	—	—	206
Master's	—	—	642	472	1,114
Educational Specialists	—	—	2	2	4
Doctoral	—	—	323	189	512
Post-Doctoral	—	—	—	—	—
Other Graduates	—	—	57	62	119
GRAND TOTAL	10,092	7,047	1,024	725	18,888

TABLE II — ENROLLMENT OF ALABAMA STUDENTS BY
COUNTIES
FALL QUARTER, 1984

County	Male	Female	Total
Autauga	65	50	115
Baldwin	135	108	243
Barbour	60	49	109
Bibb	6	4	10
Blount	29	27	56
Bullock	23	22	45
Butler	28	27	55
Calhoun	169	87	256
Chambers	110	113	223
Cherokee	23	12	35
Chilton	28	18	46
Choctaw	6	4	10
Clarke	46	22	68
Clay	43	25	68
Cleburne	19	5	24
Coffee	109	78	187
Colbert	61	39	100
Conecuh	11	9	20
Coosa	18	14	32
Covington	81	62	143
Crenshaw	18	8	26
Cullman	71	53	124
Dale	93	38	131
Dallas	60	35	95
DeKalb	64	31	95
Elmore	82	64	146
Escambia	57	42	99
Etowah	160	116	276
Fayette	14	7	21
Franklin	22	11	33
Geneva	36	33	69
Greene	5	6	11
Hale	4	7	11
Henry	30	19	49
Houston	192	127	319
Jackson	55	48	103
Jefferson	1,092	833	1,925
Lamar	9	6	15
Lauderdale	103	63	166
Lawrence	20	10	30
Lee	913	783	1,696
Limestone	57	32	89
Lowndes	15	13	28
Macon	39	37	76
Madison	560	462	1,022
Marengo	28	33	61
Marion	31	19	50
Marshall	91	50	141
Mobile	343	269	612
Monroe	43	30	73
Montgomery	554	452	1,006
Morgan	185	127	312
Perry	14	6	20
Pickens	6	9	15
Pike	35	23	58
Randolph	53	49	102
Russell	95	88	183
St. Clair	36	27	63
Shelby	101	73	174
Sumter	10	6	16
Talladega	129	103	232
Tallapoosa	110	125	235
Tuscaloosa	40	31	71
Walker	35	28	63
Washington	20	9	29
Wilcox	16	11	27
Winston	12	5	17
TOTAL (Alabama)	6,828	5,232	12,060

TABLE III — ENROLLMENT OF STUDENTS BY STATES
AND TERRITORIES
FALL QUARTER, 1984

State	Male	Female	Total
Alaska	5	3	8
Arizona	12	0	12
Arkansas	30	7	37
California	55	20	75
Colorado	19	4	23
Connecticut	31	6	37
Delaware	2	6	8
District of Columbia	6	2	8
Florida	1,045	781	1,826
Georgia	1,395	833	2,228
Hawaii	5	1	6
Idaho	5	0	5
Illinois	50	28	78
Indiana	18	17	35
Iowa	12	2	14
Kansas	7	2	9
Kentucky	129	79	208
Louisiana	55	40	95
Maine	3	3	6
Maryland	59	25	84
Massachusetts	16	7	23
Michigan	20	12	32
Minnesota	10	0	10
Mississippi	54	38	92
Missouri	20	11	31
Montana	2	4	6
Nebraska	3	0	3
Nevada	2	1	3
New Hampshire	2	1	3
New Jersey	47	25	72
New Mexico	3	1	4
New York	80	32	112
North Carolina	75	38	113
North Dakota	1	1	2
Ohio	50	21	71
Oklahoma	5	4	9
Oregon	9	2	11
Pennsylvania	46	14	60
Rhode Island	1	4	5
South Carolina	76	32	108
South Dakota	1	0	1
Tennessee	349	237	586
Texas	66	26	92
Utah	12	1	13
Vermont	1	0	1
Virginia	116	69	185
Washington	8	0	8
West Virginia	11	2	13
Wisconsin	18	7	25
Wyoming	5	0	5
TOTAL—Other States	4,052	2,449	6,501
TOTAL—All States	10,880	7,681	18,561

UNITED STATES TERRITORIES & POSSESSIONS

Puerto Rico	3	4	7
Virgin Islands	1	0	1
TOTAL—U.S. Territories & Possessions	4	4	8

TABLE IV — ENROLLMENT OF STUDENTS BY FOREIGN
COUNTRY
FALL QUARTER, 1984

Foreign Country	Male	Female	Total
Argentina	1	0	1
Australia	0	1	1
Austria	1	0	1
Bahamas	1	0	1
Bahrain	1	0	1
Bangladesh	9	2	11
Belgium	1	0	1
Bermuda	1	0	1
Brazil	3	1	4
Canada	3	6	9
Chile	1	0	1
China (People's Republic)	1	1	2
China (Taiwan)	64	25	89
Colombia	2	2	4
Costa Rica	1	0	1
Cyprus	1	0	1
Ecuador	3	0	3
Egypt	3	0	3
France	2	3	5
Germany	0	2	2
Ghana	1	0	1
Greece	2	1	3
Guatemala	2	0	2
Honduras	4	2	6
Hong Kong	2	1	3
India	20	4	24
Indonesia	7	0	7
Iran	7	1	8
Iraq	1	0	1
Israel	1	0	1
Italy	0	1	1
Jamaica, W. I.	0	2	2
Japan	3	0	3
Jordan	3	0	3
Kenya	1	1	2
Korea	19	0	19
Kuwait	1	1	2
Liberia	0	2	2
Malaysia	6	1	7
Mali	0	1	1
Mexico	6	0	6
Netherlands	3	1	4
Nicaragua	1	0	1
Nigeria	6	4	10
Norway	1	0	1
Pakistan	3	1	4
Panama	1	2	3
Philippine Islands	2	2	4
Portugal	0	1	1
Rhodesia	0	1	1
Saudi Arabia	1	0	1
Sierra Leone	1	1	2
South Africa	5	0	5
Spain	1	0	1
Sri Lanka	0	1	1
Sudan	1	0	1
Sweden	3	1	4
Switzerland	1	0	1
Thailand	6	5	11
Trinidad & Tobago	1	1	2
Turkey	2	1	3
United Kingdom	5	4	9
Venezuela	1	1	2
Vietnam	1	0	1
TOTAL—Foreign Countries	231	88	319
TOTAL STUDENTS ENROLLED			
Fall Quarter, 1984	11,115	7,773	18,888

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